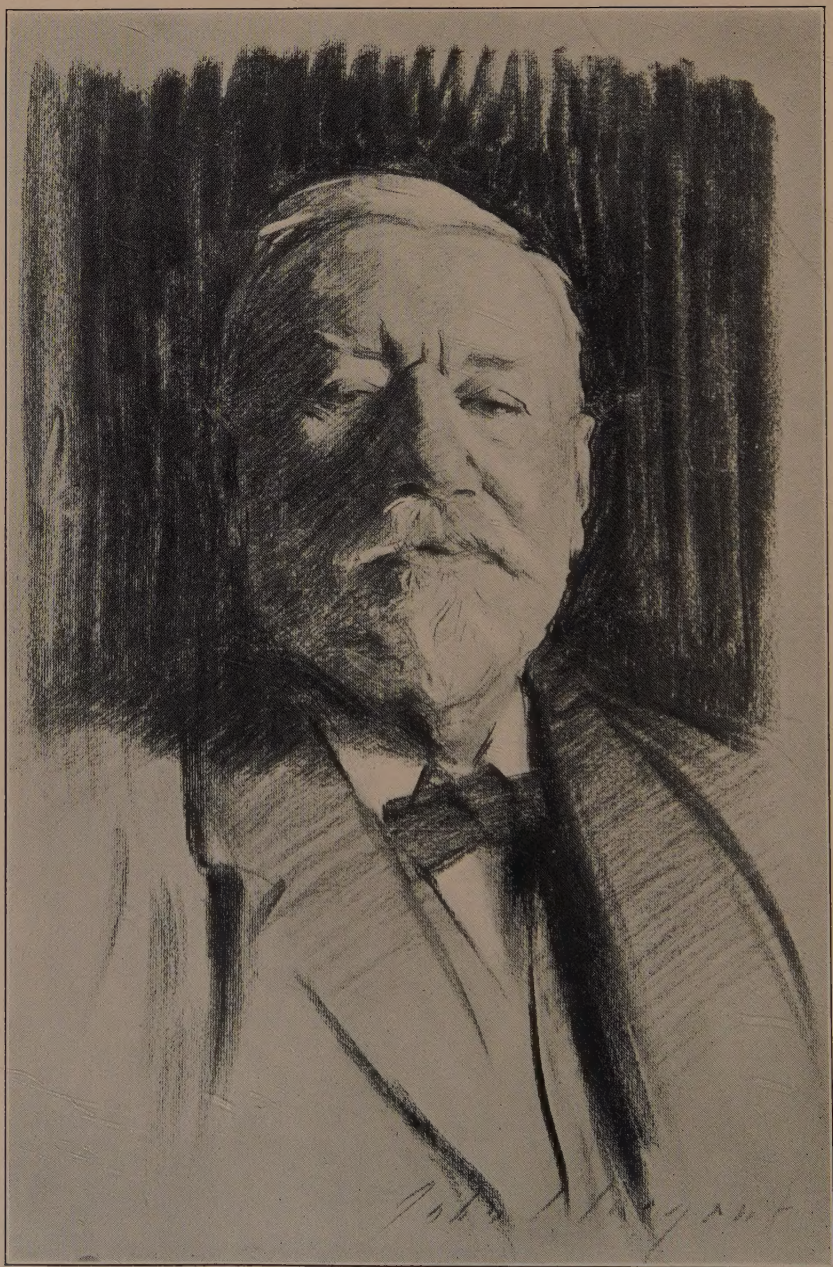


AMERICA'S GREATEST GARDEN



He Who Made It
CHARLES SPRAGUE SARGENT, LL.D.

America's Greatest Garden

The Arnold Arboretum

By

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Aristocrats of the Garden, *The Romance of our Trees*
and other works.

WITH FRONTISPIECE

and Fifty Illustrations mostly by the Author.



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TO THE ARNOLD ARBORETUM'S FRIENDS IN EVERY
LAND THIS LITTLE WORK IS CORDIALLY
DEDICATED

Preface

VISITORS in increasing thousands annually from all parts of the country journey to the Arnold Arboretum to view and enjoy its plant treasures. And not alone from this country but from Europe, Japan, Australasia and other distant lands are visitors drawn by its reputation. For a long time past there has been public demand for a popular work of moderate cost concerning it. This little book is written in response. It is not a guide book, neither does it pretend to give a full account of America's Greatest Garden. It is merely a note of invitation to a banquet of flowers and fruit provided by an assemblage of the world's best hardy trees and shrubs. The more salient features of the garden are lightly touched upon and some of its outstanding subjects are held in brief discourse, but others of equal importance are passed unnoticed. No attempt at detail or finality is made. Brevity of description combined with rigid accuracy are the keynotes, and simple language the earnest endeavor. Its appeal is intended primarily for those who love the landscape beautiful in trunk and bark, twig and bud, flower and fruit. It is hoped that those skilled in the lore of plants may find the pages not without interest though, candidly, the experts are less considered than ordinary folk. Where words fail, as they often do, let the pictures tell the story.

The Arnold Arboretum is a branch of Harvard University, situated in Jamaica Plain about five miles from the State House of Massachusetts in the city of Boston. It is open free to the public from sunrise to sunset every day in the year and is easily reached by automobile along the main city parkway or by the Elevated Railway alighting at Forest Hills station.

Like many gardens in Europe and elsewhere the Arnold Arboretum is attached to a famous University, but this is all it has in common with them. It is devoted solely to the acclimatization, cultivation and study of hardy trees and shrubs, for which purpose it was expressly founded in 1872. In this limited field the Arnold Arboretum is without a peer the world over. It is unique in that it was commenced and its work has been, and happily still is, controlled by one man over a period of more than fifty years. It has known but one director, and his energy and ability, enthusiasm and devotion have made it what it is today. It is known wherever plants are loved and studied, and of its bounty gardens in every land have shared.

Toward bringing man nearer unto man this garden is a potent force. It exists for service, which service knows no boundary of race or creed. The Arnold Arboretum is worthy of the Nation and of the Nation's pride. Accept the invitation here sent forth. Visit and judge of its value to the culture and amity of mankind.

E. H. WILSON.

Boston, Mass., March, 1925.

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AMERICA'S GREATEST GARDEN



What It Is

A BIT of beautiful New England forever preserved as a garden in which is planted all that is hardy among woody plants. A garden of trees and shrubs assembled together from the uttermost parts of the northern Hemisphere and open free to all every day in the year. A garden where bosky hills, wooded knolls, steep cliffs, open meadows and valleys are fragrant with the odors of foliage, flower and fruit. A garden where the birds may breed unmolested and where they can find food in abundance at all seasons of the year. Such is the Arnold Arboretum of Harvard University. It was ever a bit of New England but its conversion into a wonderful garden has been the life work of its Director, Professor Charles S. Sargent.

In 1922 the Arboretum celebrated its first jubilee and the story of its struggles and achievements has been modestly recorded by Professor Sargent in his *The First Fifty Years of the Arnold Arboretum* to which this chapter is greatly indebted.

The Arboretum owes its origin to the imagination of George B. Emerson, author of the well-known work on the *Trees and Shrubs of Massachusetts*, and to

the munificence of Mr. James Arnold, a merchant of New Bedford, Massachusetts. Mr. Arnold gave one and one-quarter of the twenty-four parts into which he divided his residuary estate "To George B. Emerson, John James Dixwell and Francis E. Parker, Esqrs. of Boston in trust: to be by them applied for the promotion of Agricultural or Horticultural improvement, or other Philosophical, or Philanthropic purposes at their discretion, and to provide for the continuance of this Trust hereafter to such persons, and on such conditions as they, or a majority of them, may deem proper to carry out the intention of the donor." Two of the three men appointed by Mr. Arnold to administer his bequest were interested in trees and understood the importance to the world of more knowledge in regard to them than could at that time be obtained in America. It was therefore natural that the idea of a scientific station for the study and cultivation of trees should have occurred to them and fortunately they realized that such an institution could be permanently and safely controlled by Harvard College. Mr. Arnold died December 3, 1869 and on March 29, 1872 an arrangement was signed between his Trustees and the President and Fellows of Harvard College whereby the latter received an endowment of \$103,847.57 and agreed to devote 125 acres of land known as the Bussey Farm to the purpose of forming an arboretum to be called the Arnold Arboretum wherein to grow every tree and shrub able to



"A bit of beautiful New England preserved forever as a garden"

withstand in the open ground the climate of New England. On November 24, 1873, Charles Sprague Sargent was appointed Director of the new Arboretum and Arnold Professor of Dendrology. With characteristic candor and modesty he states in the work mentioned above that "The prospect of being able to establish a useful institution would not have been encouraging if the men interested in it had had at that time as much knowledge as hope and enthusiasm. For it is safe to say that not one of them had an idea of what an Arboretum might be or what it was going to cost in time and money to carry out the provisions of the indenture between the Trustees under Mr. Arnold's will and the President and Fellows of Harvard College; and certainly not one of them was more ignorant of the subject than the man selected to carry on the provisions of this agreement. He found himself with a worn-out farm, partly covered with natural plantations of native trees nearly ruined by excessive pasturage, to be developed into a scientific garden with less than three thousand dollars a year available for the purpose. He was without equipment or the support and encouragement of the general public which then knew nothing about an Arboretum and what it was expected to accomplish." Such was the genesis of the Arboretum and what it is today is the outcome of Professor Sargent's "hope and enthusiasm" combined with untiring energy, unflinching resolve and doggedness of purpose.

In 1873, Mr. Frederick Law Olmsted was engaged in planning and constructing a park system for the City of Boston and he suggested that that part of the Bussey farm which was to be devoted to the Arboretum might be used with certain restrictions as one of the Boston parks. The suggestion met with little favor and was opposed by the Governing Board of Harvard College and by the Park Commissioners of Boston. The public press was indifferent and its only enthusiastic supporters were Mr. Olmsted and the Director of the Arboretum. After ten years of hard semi-political work Mr. Olmsted's plan was accepted and an agreement between the City of Boston through its Park Commission and the President and Fellows of Harvard College was signed on December 30, 1882. The city agreed to add certain adjoining lands to the Arboretum, to construct and maintain a system of roads and walks, to police the grounds and to assume all taxes which might be levied on the property for the term for which the contract was made. In return for this assistance the University agreed to open the Arboretum to the public at all reasonable times as part of the park system of Boston and to pay a yearly rent of one dollar. The contract was made for one thousand years with provision for its renewal for a further period of one thousand years and so on forever. This is the wisest and most far-seeing contract of its kind that has ever been drawn up in the history of gardens



"A garden in which is found all that is hardy among woody plants"

for it insures the permanency of the Arboretum in its present position for a thousand years and in all probability forever.

To the original 125 acres others have been added by the City of Boston, by Harvard College and through the generosity of various friends until the present area of the Arboretum is approximately 250 acres. Situated in West Roxbury it is easily reached from any part of the City of Boston by electric cars. It is open from sunrise to sunset every day in the year to the public who are free to walk anywhere, to drive or ride horses along the roads, but motor vehicles are excluded. Most of the Arboretum is surrounded by a low wall of stone supporting a wire fence and it is hoped to so eventually enclose the whole. Climbing plants in rich variety are planted at the base of the wall and clothe the whole fencing in a beautiful tangle. Entrance to the Arboretum is through nine gateways.

The natural features of the Arboretum are varied and pleasing, for within its boundaries are found ponds, meadows, hills, valleys and steep cliffs, and through it wanders a delightful stream of ever running waters known as Bussey Brook. The ground rises gradually from the great meadow at its north end where the native flora is allowed to luxuriate at will, to the summit of a hill, known as Bussey Hill, from which distant views of the Blue Hills to the south and of Cambridge and Boston to the north are obtained. Beyond to the southwest, separated by deep valleys, wooded cliffs and

knolls, rises the still higher eminence known as Peters Hill. The greatest natural feature and the Arbotum's proudest possession is Hemlock Hill, with its high steep cliffs rising on the north from the Bussey Brook and covered so thickly with Hemlock trees that the rays of the sun rarely penetrate to the ground between them. In no other public garden in the world are there such cliffs, clothed with so beautiful a remnant of coniferous forest. A White Pine occasionally towers above the Hemlocks and a Birch or Sugar Maple here and there enlivens the effect of their sombre crowns with the tender green of vernal leaves, or with the brilliancy of autumn colors. Within the Hemlock grove reigns the stillness of primeval forest, broken only by the babbling of the waters which wash its feet. In the height of summer, with native ferns carpeting the ground, it is a cool and charming spot, and within the limits of no other city can such a grand and inspiring bit of natural forest be found. Oaks, White, Red and Black, with other native trees from one hundred to perhaps two hundred years old, cover knolls and low hills and are valuable in showing several important New England trees in their adult state. Many of these old trees, languishing when the Arbotum was founded, have been won back to vigorous health by a judicious system of pruning. Every effort is made to maintain these woods and the indigenous undergrowth in a natural state.



The Hemlock Grove is the Arboretum's proudest possession

The collections of trees are arranged by groups of species which are called genera, and the genera, so far as it has been found practicable to do so, have been planted according to their botanical relationships into larger groups called families. The arrangement begins with Magnolias at the Jamaica Plain Gate and ends with the Conifers at the Walter Street Gate. That they may show their habit under different conditions, several individuals of important North American species have been planted close together in groups and at a distance from the groups an individual of the species is planted with sufficient space about it to insure a full development of branches. A representative of almost every genus stands near the drive, so that visitors passing along the Arboretum roads and gravel paths can obtain an idea of the genera of trees hardy in Massachusetts and of their relation to each other. Access to the different groups is secured by grass covered paths several miles in length which reach every part of the Arboretum. The shrubs are arranged primarily in a series of formal beds and known as the Shrub Collection, and partly in large, irregular groups of species planted along the drives as near as possible to the groups of trees of the same families.

For the instruction of visitors, metal labels six inches long and four inches wide painted brown, with their Latin and English names and their native country in black letters, are fastened with copper nails to the trunks of large trees at about the height of the eye;

similar labels fixed on iron stands are placed before the smaller plants and those in the general shrub collection. Small trees and large shrubs are furnished with oblong wooden labels about eight inches long painted white with black letters, and hang from a branch in a conspicuous position. In addition small zinc labels on which is stamped its name and record is attached to a branch of every important plant in the Arboretum.

There are now growing in the Arboretum between five and six thousand species and varieties of trees and shrubs belonging to eighty-seven families and three hundred twenty-five genera. The regions of the world represented by the living collection are the cool, temperate and colder parts of North America, Europe and Asia. No plants from the southern Hemisphere, not even from the high Andes, southern Chile, or the higher mountains of New Zealand, have proved hardy in the Arboretum.

Spring Pageantry

SPRING is the blithesome season of the year and entrancing are the Arboretum landscapes everywhere rich with bursting buds on tree and shrub. It is indeed a gladsome season and mankind, tired of winter, is in a receptive mood. Spirits rise with the increasing temperature and we stroll abroad to enjoy the balmy air laden with the fragrance of opening flower and leaf. Vegetation awakens refreshed from a long winter sleep, yawns, stretches itself, springs up and orderly, and with rapidity, commences the season's work. Roots, never profoundly asleep, become wide awake and energetically active, drawing in from the surrounding earth water and food-salts in solution which are transported through specially organized tissues to the growing points of tree, shrub and herb. The sap commences to rise and like warm blood coursing through the body gives to twig, shoot and stem a fresh and healthy hue like the blushes that suffuse a maiden's cheeks. Starch and other reserves of food are transformed into sugars for immediate use. Growth commences. The bud-scales which have so splendidly protected the vital growing points of leafy shoots or shielded embryo flowers are thrown aside, — hastily and without a show of gratitude by some plants, tardily in others where they grow considerably and often become highly colored and conspicuous as in the

Hickories and Buckeyes. Where the flowers take precedence over foliage the naked stems are rapidly festooned with blossoms. In other plants, leaves green and naked or swaddled in down of varying hues peer forth to bask in the sunshine and bathe in the dew and rain. In orderly haste vegetation robes itself in clean and fresh apparel and vigorously commences the season's work of elaborating food for the growth of new leafy shoots, for the development of the flowers and for the perfecting of seeds from which new generations arise and the life of the species is continued. The struggle for existence is keen and unrelenting. There is no room for slackers and the unfit are soon suppressed. Stern are the laws that govern Nature's children and their transgression is ever punished. Keep ye the law, rings the Voice echoing and re-echoing through the forest and meadow and over the hill-top, and those that fail to heed the clarion call cannot evade the penalty which is starvation and death. Charity is unknown in the forest and meadow but must be exercised in gardens if our favorite plants are to be happy, lusty and long lived. And charity reigns in the Arboretum; if this be doubted ask of the broad tangle of Forsythias or Golden-bells clothing the slope on the left where starts the Bussey Hill Road. This tangle of exuberant growth is one of the floral feasts of the Arboretum in early spring when dowered in its millions of clear yellow bells. Not a leaf shows on the gray twigs of neighboring shrubs and trees and the



Spring landscapes rich with bursting buds on tree and shrub

only green is that of springing blades of grass, but this yellow mass of flowers illumines the landscape from every vantage point. The brilliancy of the scene is startling and the effect almost magical. Facing this group a large bush of Cornelian Cherry (*Cornus mas*) may be seen with hundreds of naked stems studded with small yellow flowers. And nearby glow clumps of lustrous crimson-stemmed Dogwoods all in the shadow of a silent pond, the waters of which reflect the scene.

A landscape of alluring loveliness is that from the Overlook on Bussey Hill looking over and through the Oaks to the Pinetum in the distance and Hemlock Hill on the left. The Oaks with their unfolding leaves, clothed in light gray and rose tinted down-like hairs, capping myriad twigs and the dark green of the many coniferous trees beyond are strikingly beautiful. The trunks and major branches stand clear against the sky but their crowns are decked with gossamer-like webs of color. More extensive is the view from the summit of Peters Hill. From this eminence a large part of the Arboretum is spread before one and marked is the contrast between the wooded knolls of deciduous trees with their variously tinted unfolding leaves and the dark forms of Pine, Fir and Hemlock. 'Tis a panorama of woodland beauty, unsullied, inspiring, and a responsive heart and mind throbs with delight and gratitude.

Another pleasing scene is presented by the many Willows which fringe one side of the great meadow near the Administration Building. Their ascending, spreading or pendent stems, pliant, and glowing green, yellow or purple bear in thousands catkins of flowers, the familiar "pussies" of our childhood. Some Willows have agreeably scented resinous buds, a character most pleasingly developed in their cousins, the aromatic Balsam Poplars. On the margins of natural woods and elsewhere in the Arboretum the Flowering Dogwood (*Cornus florida*) has been planted very extensively. When the winters have not been too severe these plants flower freely in the spring, their large pure white bracts forming a saucer in which is contained a cluster of small yellowish flowers. Shadbushes (*Amelanchier*) are similarly planted, and their slender stems crowded with racemose clusters of pure white flowers combined with the unfolding leaves, red-brown in some, pale gray from a dense covering of woolly hairs in others, are most pleasing, suggesting in the landscape thin clouds of mist.

Near the Forest Hills Gate the Cherry trees are a picture of ethereal loveliness. Beyond the Lilacs on the opposite side of the Bussey Hill Road a clump of fragrant Spicebush (*Benzoin aestivale*) is yellow with clustered blossoms and, nearby, are large bushes of the Leatherwood (*Dirca palustris*) starred with pale yellow flowers from each of which tiny anthers protrude. The bark of the Leatherwood is fibrous and



Across the mirrored pond the Cherries are in blossom, spring is here

Photograph by G. A. Root

exceedingly tough yet the plants are easily split and broken by snows weighting down the stems in winter.

First of the shrubs to put forth clear green leaves is *Prinsepia sinensis*, a native of Manchuria and which knows not China, its specific name notwithstanding. This is a curious plant with thorny, arching and interlacing gray stems and branches, axillary, soft yellow saucer-shape, fragrant flowers and a plum-like fruit in which reposes a large flattened stone whose surface is finely ridged and roughened. If a shoot be split lengthwise the pith will be seen to be arranged in a series of delicate plates one above another as in the Walnuts and a few other plants. *Prinsepia* is a member of the great Rose Family and the only genus in this vast group that has a lamellate pith. Four species only are known and three have white flowers: one of these (*P. utilis*) grows on the Himalayas of northern India, one (*P. scandens*) on the mountains of Formosa, another (*P. uniflora*) is native of north China; the fourth, as told, hails from Manchuria. In the Shrub Collection and on Azalea Path may be seen fine specimens of the yellow-flowered *P. sinensis*. On Bussey Hill among the new Chinese plants grows a large plant of the white-flowered *P. uniflora*. The others are tender and cannot be grown in the Arboretum.

On a bank beneath some old White Pine trees on Bussey Hill flourishes a group of *Rhododendron dauricum* var. *mucronulatum* which in early spring presents one of the prettiest pictures in the whole Arboretum.

Before any sign of leaves appears the stems of this Rhododendron or Azalea are crowded with exquisite rosy pink bells. The plants though not very large are old and of picturesque habit and framed against a clear blue sky and beneath the sombre shadow of the Pine trees their wealth of blossoms make a fascinating scene. This plant is wide-spread in northeastern Asia being particularly abundant on the rocky hills of Korea and its flowers are remarkably resistant to frosts. 'Tis a plant that should be grown extensively in New England gardens.

The Arbor-vitae are throwing off their yellow-brown mask and assuming a cheerful green; the glorious Beeches are thrusting forth their bright green leaves all wrapped in pale gray, silky hairs; graceful Birch, valiant Hickory and noble Oak are emulating Maple, Elm, Willow, Poplar and hosts of other plants. Bursting buds and opening flowers scent the air. The feast is being rapidly spread and the Arboretum opens wide the gate of welcome to all who delight in the beauties of spring.



Summer luxuriance (*Viburnum affine*)

Summer Luxuriance

SUMMER, the holiday season with mankind, is the season when plants labor the hardest. Outward signs are not marked as in the explosive development of spring or the robing in brilliant colors in autumn. But the work is being unceasingly carried on. Every organ from the tip of the most outlying rootlet to the topmost leaf is making its maximum endeavor in the paths of duty. Water and food salts are absorbed from the soil by myriad rootlets conveyed by a perfect transportation system to the leaves. The leaves absorb carbon-dioxide from the air and in their laboratories break it up and recombine the elements with those of the food-salts to form sugar for immediate use in perfecting the growth of shoot and root and the maturing of the fruit and seeds. Water is disposed of and the surplus food converted into starches and stored away. All this orderly business though hidden is carried on in the leaf canopy whose cool shade we seek from the heat of the day. Cool retreats are many in the Arboretum and delightful are the Hemlock grove and woods.

During the early part of July the Basswoods or Lindens (*Tilia*), the largest genus of hardy summer-flowering trees, put forth the fragrant honey-laden pendent blossoms, cream-colored or white and clustered at the ends of the long hanging stalk which is supported

by an oblong shield. The flowers draw the bees from near and far and the trees are filled with the sound of bee-life and intense activity. The Lindens are grouped in a meadow on the right hand side of the Meadow Road, — shapely trees of varying sizes drawn from Europe and Asia as well as from the forests of this country. As a rule the trees of the Orient thrive better in the Arboretum than those of Europe but the Lindens are an exception; indeed, the European sorts grow better and are handsomer trees than the native Basswoods. At any time of the day it is good to stroll among these trees and feast on draughts of honeyed fragrance, but the early morning before the dew is spent is best.

If the Lindens be the last major groups to blossom there are individual trees and shrubs in variety which produce their flowers in the summer season. At the end of the Linden group and on the edge of the road are three trees with clear yellow blossoms, small but produced many together in broad pyramids at the end of every shoot. This is the so-called Varnish-tree (*Koelreuteria paniculata*) from the Orient, unique at this season in the color of its flowers and later in its bladder-like top-shaped fruits which contain jet black seeds, round and resembling buckshot. Another Oriental tree also in flower is the Pagoda-tree (*Sophora japonica*) growing on the right hand side of the Bussey Hill road opposite the Lilacs. This has, in quantity, cream-colored, pea-like flowers also in clusters at the



A cool retreat midst Fern and Hemlock

end of the shoots. This is a member of the vast Pea family and has a long, jointed fruit pod, soft and soapy within.

At the Jamaica Plain gate visitors at midsummer are greeted by an atmosphere filled with spicy odor. This fragrance is from the white chalices of the Sweet Bay (*Magnolia virginiana*), one of the loveliest of native small trees whose northern station of distribution is Magnolia, Mass., hence the town's name. But everywhere one strolls in the Arboretum on long summer days flowers will be seen and fragrance greets the nostrils. By the roadsides in quantity grows the fragrant Pepper-bush (*Clethra alnifolia*) in summer alight with erect spikes of the purest white. The last of the Buckeyes, the shrubby *Aesculus parviflora*, holds aloft its white candles with out-thrust, brush-like masses of stamens, each rose-tipped; a broad clump with two stories of flowers is a July feature at the foot of a wooded knoll beyond the Linden group. Here and there in the shrubberies are clumps of the white flowered *Azalea viscosa* and *A. arborescens*, last of their clan to blossom and fragrant as perfumed nectar. In the Shrub Garden scores of bushes are laden with blossoms, white, yellow, pink and red. Most attractive is the Heather with its pink and white flowers raceming every shoot and recalling Scotland and other parts of Europe. These plants of nest-like habit are of strong social instinct—clannish to the extreme—they strive to cover the land in a carpet of growth,

loving the sunshine and wind, resenting the presence of other plants and sulking bitterly when tall bushes invade their domain. Fruits, too, there be, ripe and luscious in appearance, on many a Honeysuckle bush, first of shrubs to ripen their berries and in such profusion borne as to weigh down the arching branches.

The meadow on the left of the Meadow Road margined by tall Willows on one side, Maples, Shad-bushes and a miscellany of shrubs on the edge of the road is the delight of late summer and early fall. This piece of low-lying land is given over to the native herbs in which the Goldenrod predominates. But Jewel-weed, Purple Loose-strife, Elderberry, Joe Pie-weed in groups and many other vigorous plants add variety. Here and there a plant of the handsome Canadian Lily (*Lilium canadense*) may be seen in blossom. Once the Fringed Gentian and other rare and delicate plants grew in this meadow. But changed conditions and the relentless law of the survival of the strongest have caused these to disappear and their place usurped by more vigorous plants.

A place of never failing delight is the Bussey Brook which flows from the Walter Street entrance through the Pinetum to Hemlock Grove and beyond. This perennial stream of cool water babbles and sparkles most joyously in summer time. Once trout sported themselves occasionally in this stream but that was before the small boy came and made discovery. But if the fish have gone a profusion of wild flowers have



Holding aloft its white candles with their out-thrust brush-like stamens in July (Aesculus parviflora)

found a congenial home along its cool margin. Among a luxuriant growth of Jewel-weed, Joe Pie, Sedges, Grasses and the like, are many outstanding clumps of Black-fruited Elder (*Sambucus canadensis*) with broad heads of white flowers soon followed by jet black fruits, luscious and weighing down the heads. The birds have had a hand in this planting and an excellent piece of work have they done.

In the woods the natural growth is undisturbed and protected. Sweet Fern is common in rocky sunny places and the odor from its crushed leaves is soothing to the senses. Dwarf Blueberry and Huckleberry carpet the more open woodlands. Invitation to linger on the stroll, to sit or lie among the pleasant scenes and enjoy the luxury of outdoor life and ease, to fill the lungs with pure air steeped in fragrance of a thousand pleasant living things are thrust on the visitor at every hand. Summer or winter, spring or autumn, the Arboretum spreads its pageant of color, fragrance and form.

Autumn Glory

GLORIOUS in autumn are the Arboretum landscapes clad with gaily tinted foliage and wealthy in brilliantly colored fruits. The presence of exotic plants from Europe and Asia produces contrasts greater than those afforded by the purely native vegetation of New England. The trees and shrubs of Japan and China have more orange in their autumn tints than is usual in American plants and as they assume their coloring about two weeks later they prolong the season and are doubly welcome. Those of Europe color only slightly but retain their green mantle until after the leaves of most of the American and Asiatic plants have fallen and are most conspicuous in the late fall. With color rampant and ravishingly beautiful on every side it is difficult to pick and choose. Every turning of every path reveals some plant, vista or landscape each more lovely than the last until one is lost completely in admiration of the scenes. Glancing to the left from a riot of yellow, gold, orange and scarlet of Birch, Hickory, Oak and Sassafras the eye lights on the restful green of hundreds of Lilac bushes above which glow the yellow of Catalpa, Mulberry and Elm. The bank of Golden-bells (*Forsythia*) is mostly dark green, but here and there are bushes with vinous-purple autumn leaves and in the rear towers a



Latest of the Viburnums to wreath itself in white is the summer-flowering V. Canbyi

clump of White Ash (*Fraxinus americana*) mantled in chocolate, vinous purple and orange.

The first of the trees to clothe itself in autumn robes is the Red Maple (*Acer rubrum*) and in no other species of tree or shrub is greater or richer variety shown. Every known shade of autumn coloring is exhibited by this American Maple: moreover, some trees color early, others late; some are quite bare of leaves when others are still as green as at midsummer. A tree of diverse character, the Red Maple is possessed of marked individuality. Facing the Administration Building is a particularly fine young specimen which changes to rich shades of purple, crimson and scarlet. It is of unusual interest, for it is a grafted plant specially raised because of its particularly intense autumn coloring and demonstrates that autumn tints of a particular color may be perpetuated by grafting in the same manner as selected flowers and fruits are perpetuated. On the left of the Meadow Road there is a Red Maple (var. *pallidiflorum*) with orange and yellow autumn foliage and yellow flowers in early spring which suggests color correlation.

One of the first trees to disrobe in autumn is the curious Amur Cork-tree (*Phellodendron amurense*). The leaves change from lustrous green to rich, clear yellow, making the tree strikingly conspicuous for a few days, but by the first week in October it is bare. The deeply corrugated bark of this handsome tree, of which two fine specimens unique in cultivation in Amer-

ica grow facing the Lindens on the right hand side of the Meadow Road, is curious and attractive at all seasons.

On entering by the Centre Street gate on the immediate left is seen one of the most charming bits of roadside planting imaginable. Nestling below and embracing the feet of a hedge of Thunberg's Barberry backed by a few trees of Flowering Dogwood (*Cornus florida*) is a mass of Fragrant Sumach (*Rhus canadensis*) forming a perfect ground cover. In early October the whole is orange and red to crimson with myriads of glistening scarlet berries of Barberry strung everywhere about. Nothing of its kind could be more effective than this combination of plants.

On the left ascending the Bussey Hill Road, is another arresting feature. It is merely a dense tangle of Japanese Bittersweet (*Celastrus articulata*) but how beautiful!—a mass of clear yellow foliage and a wild profusion of fruits with deep yellow husks cracked open, disclosing the clustered seeds clad in jackets of cinnabar-red.

Of richly colored fruit, plenteous feast for feathered friends, there is no end. On every side bushes, trees and vines are richly laden. Among the Cornels white, yellow, scarlet and blue are bunched in masses, Honey-suckles crowded with red and crimson beads whilst the slender stems of the Snowberry bushes bend beneath the weight of their snow-white berries. Like tiny globules of sealing wax shine the clustered masses of



Autumn brings a wealth of brilliant colored fruits (*Berberis vulgaris*)

fruit on the Black Alders (*Ilex verticillata* and *I. laevigata*) whilst a Japanese relative (*I. geniculata*) has its fruits suspended on thread-like purple-brown jointed stalks. Nearby, with jet-like beads, grows the evergreen Ink-berry (*Ilex glabra*). Beyond the Lilacs on Bussey Hill Road flourishes a magnificent specimen of the Sapphire-berry (*Symplocos paniculata*), one of the original plants first introduced into cultivation from Japan in 1875 by Thomas Hogg. Its fruits, as pure and blue as the finest lapis-lazuli, glistening erect among the deep green foliage like the gems they are, convince us that there is no more remarkable fruiting shrub than this. The next moment proves us fickle for the love we have sworn at the feet of the Asiatic jewel is transferred to our own Black Haw (*Viburnum prunifolium*), with its gorgeous purple to crimson-red foliage and clustered masses of pink and red changing to violet-black berries at the end of every twig. A plant of distinct and shapely habit is this aristocrat of a goodly and most useful tribe. Thorns laden with scarlet and crimson haws, Mountain Ash with dense clusters of lustrous red, Crabapples decked with red, yellow and parti-colored fruits are not to be denied their just meed of praise. And soon we are convinced that in the midst of beauty so pure, varied and plenteous, it is impossible to single out any one particular plant or group as peer above their fellows. Wandering on slowly, loitering and pausing to admire plants of the home land and plants from regions far beyond

the seas we arrive at the overlook which crowns Bussey Hill. The view is commanding. To the northward, five miles distant through the smoke and haze the golden dome of the State House, the lofty Customs Tower and other dominant buildings of Boston are discernible. To the southward the Blue Hills bathed in mists of violet and indigo mark the horizon. Almost at our feet rises the sublime Hemlock Hill, its restful blackish green canopy cleft here and there with splashes of yellow and orange from an odd tree of Black Birch, Tulip and Sugar Maple. Around us on all sides are Oaks, Elms, Hickory and other trees, a riot of colored foliage; and just beyond to the westward looms the Pinetum with varied greens and grays of Red Cedar, Pine, Spruce and noble Fir. The sun clear set in a deep blue sky with a thin veil of haze deepening the calm of an October afternoon, views of hill and valley, woodland and meadow, bare rocks and tangled thickets of shrubs and vines—no landscapes could be more varied, more delightful, more restful or more satisfying than those of the Arnold Arboretum in the autumn.



Mountain Ash with clusters of lustrous red jewels (Sorbus americana)

Winter Beauty

NOT in the darkest and most dreary of winter days is a garden of trees and shrubs devoid of beauty. The leaves have fallen but the deciduous woody plants stand boldly forth and display to full advantage the exquisite tracery of their branches and the varied characters of their buds and barks. Indeed, it is winter when naked that the characteristics of their habit and form are most clearly pronounced. Trees stamp their individualities on the landscape and after a little study the different kinds are easily recognized from a distance. A garden of herbs at its best has its charms restricted to three seasons of the year, but a garden of trees and shrubs has no such limitations for its charms are perennial and vary in aspect throughout the four seasons. A fall of snow covers the ground and hides all herbs from view but with trees and shrubs it is merely a foil which heightens by contrast their beauty of form. Scarcely any two species of trees are absolutely identical in habit and manner of branching and among individuals of the same species there is often wide divergence in these respects. In the Arboretum where woody plants from all the colder parts of the northern hemisphere are congregated these differences are markedly shown.

Among trees the arrangement of the major branches and the tracery of the branchlets is most instructive.

The main branches are rigid and may be ascending, spreading or arching, thus determining the shape of the crown, but it is the branchlets that embroider it even as in summer the foliage drapes the whole. These branchlets may be laxly or rigidly spreading or intricately placed, or, they may be erect, ascending, horizontal, arching or pendent. When the branchlets are sparse, as in the Kentucky Coffee-tree, the crown is thin and gaunt, but when the branchlets are numerous, as in the American White Elm, they form a graceful web or network.

The barks of trees are possessed of much character and rare beauty and are deserving of greater notice than is generally accorded them. Take the smooth pure white thin bark of the Canoe Birch, the thin gray-brown papery bark, torn and bunched, of the River Birch, the smooth, firm, pale gray bark of the American Beech, the dark deeply fissured, rugged bark of the American White Elm, Black Walnut or Red Oak, the gray, fissured corky bark of the Asiatic Cork-tree, the thick, flaking bark of the Shagbark Hickory, or the black bark, fissured into tiny squares, of the American Persimmon. Are these not worthy of favorable recognition and comment? Surely they cannot be passed by; neither can the striped-bark Maples with smooth green bark, plenteously marked with lines of white, nor *Acer griseum*, from the mountains of central China, with loose, shaggy, orange-brown bark. Then there are certain Dogwoods of shrubby habit whose barks



The Lady of the Woods and her guardian Conifers

are yellow or crimson of startling brilliancy which illumine the winter landscapes, as do the red stems of the common seashore Rose of New England (*Rosa virginiana*).

The winter buds with their closely packed scales which protect the tender growing points are also rich in interest. In the Beech the winter buds are long and pointed, in the Common Lilac stout and rounded, in the Horse-chestnut broad-ovoid, sticky and glistening, whereas in the related Buckeyes, though the shape is the same, the buds are dry and gray. In the Oaks they are small and in many species covered with hairs. And handsome, indeed, are the glistening, jet-black winter buds of the curious Japanese *Euptelea polyandra*. In the Yellow-wood and Asiatic Cork-tree the winter buds are set within the circular scar of the fallen leaf, in others they are seated within a horse-shoe or crescent-shape scar. In the Walnut there are two or three buds set one above another and covered with scales; in the curious *Pterocarya* the several buds are similarly arranged, but strange to say they are naked and quite without the usual covering of scales.

The branchlets of the Elms, Silver and Red Maples are crowded with clustered flower-buds. On the Birch and *Corylus* hang in thousands clusters of gray, male catkins and the stems of the Golden-bells, Spice-bush, Leatherwood, Japanese Witch-hazel are studded with flower-buds. All are ready to burst into bloom at the first blush of spring. Occasionally in a mild February

some of these incautiously open their flowers only to be nipped by heartless Jack Frost. Nor are flowers altogether lacking, for in normal winters a Witch-hazel (*Hamamelis vernalis*), native of the gravelly riverbeds of Missouri, unfolds its yellow star-like flowers, the petals spreading from a wine-colored chalice. And before the snow has finally left us the white and rosy urns of the charming little *Erica carnea* are fearlessly put forth to gladden the heart with the message that spring is nigh.

Throughout the winter berries red, white and black jewel the bushes of Barberry, Cotoneaster, Black Alder, Snowberry and Privet as do shining scarlet fruits on such trees as the Washington Thorn (*Crataegus cordata*), the flat-topped *C. nitida* and a few other species, and black fruits on the Asiatic Cork-tree.

Of broadleaf evergreen trees one only can be grown in the Arboretum and the shrubs of this class are very limited in number. The Holly-tree (*Ilex opaca*) survives in a sheltered spot in the lee of the Hemlock grove. The Ink-berry (*Ilex glabra*) is cheerful enough through all but the most exceptionally severe winters. The Andromeda (*Pieris floribunda*) with flower clusters standing above its green leaves all ready to open in the spring laughs at New England winters. The evergreen Rhododendrons hang down their leaves and curl them vertically as if distressingly anxious to protect them to the utmost. In marked contrast is the Mountain Laurel (*Kalmia latifolia*) holding its leaves



Silvery Gray Beech and frozen brook

outspread as in summertime, and glorying in the fact that it is New England's best and worthiest broadleaf evergreen.

A winter landscape in the Arboretum of which I never tire has for its dominant note the large clump of American Beech on the left bank of the Bussey Brook near the Arbor-vitae and opposite the northern end of the Hemlock grove. The parent tree is dead but from its far spreading roots scores of saplings have sprung up and form a large thicket. Right and left are Conifers and beyond in the distance a steep slope where grow Oaks on the skyline of which are three old White Pine trees. In this setting the clump of Beech with its pale gray bark and myriads of slender, spreading branches suggests from a distance a billowy cloud of morning mists.

The grandeur of the Hemlock grove, impressive at all seasons, is especially so in winter with its dark mass of foliage and trunks standing sentinel-like above the carpet of snow. The Pines, Firs and Japanese Yew take on a richer deeper hue in winter, the green is darker, the gray-color brighter and the contrast greater. The wind as it blows through the branches may sing a glee or a dirge but it is warmer in the shelter of these restful evergreen trees. Viewed from near or far the Pinetum in winter presents one of the finest of landscapes. Black, green or gray pyramids and columns reared against the sky above the snow-covered ground—no scene could be more restful, in-

spiring or grand. A protective yellow-brown pigment marks the green of the Arbor-vitae during the winter detracting from their beauty, but not so the purple pigment developed in the lovely *Juniperus horizontalis*, finest of all the low-growing Savins.

Be the winter days never so frosty and the snow no matter how many feet deep the Arboretum landscapes are rich in changeful beauty reflecting the play of light and shade. Eyes and hearts attuned to nature can best appreciate these winter scenes yet none but blind souls can be altogether indifferent toward their peaceful charm.

Cherry Blossom Festival

THE Cherry trees are blooming, true sign that spring is here. Hidden in clustered buds and protected through the winter's ordeal by dry brown scales, winsome blushing beauty bursts forth to gladden the hearts of men. On an April's day with the warm sun and clear blue skies above, the emerald green of young grass beneath, there could scarcely be a more pleasing sight than the group of Cherry trees blossoming on the lawn just within the Forest Hills gate. Much effort has been taken to make the Arboretum collection of Cherries as rich and complete as possible but the New England winter is too severe for some of them. The trees are grouped in three separate places affording different aspects and a considerable measure of success has resulted. The oldest group is that on the right entering by the Forest Hills gate. A more recent group is that on the grassy knoll of Bussey Hill which is composed entirely of varieties from Japan and China. On Peters Hill there is a more varied collection and many of the sorts thrive better there than elsewhere in the Arboretum. Visitors often ask if the fruits of the flowering Cherry-trees are edible. The answer is yes, but they are very small and of few kinds are they palatable except to the birds. It is for the delicate beauty, the ethereal loveliness of its myriads of blossoms that the Cherry-tree

is well nigh worshipped in Japan and is planted so extensively in the Arboretum.

The flowering of the Cherries in the Arboretum is a movable feast dependent upon the earliness or lateness of spring and may happen any time between the middle of April and the beginning of May. Thanks to the variety of species the feast of loveliness is spread over a full three weeks. One of the very first to open its blossoms is *Prunus subhirtella*, the Higan-zakura or Spring Cherry of Japan. Slender of branch and most prodigal of bloom this lovely daughter of a large-limbed tree of great dimensions is Queen of all. Its flowers last longer in good condition than those of other Cherries. Pink when they open the petals become nearly white before they fall. Opening before the leaves appear the flowers are produced in such profusion as to hide the branches and from a distance the trees resemble billows of mists. The tree itself never grows to any considerable size. The two large plants in the Arboretum are the original introductions into cultivation in the Occident and were received from the Botanic Gardens, Tokyo, in 1894. These are broad, round-topped, intricately and densely branched trees some 20 feet tall and 25 feet through the crown the lower branches sweeping the ground. This Cherry is not known in a wild state and does not reproduce itself truly from seed though fortunately it may be increased by cuttings. It is very generally cultivated in western Japan but rarely seen in the neighbor-



Queen of all is the Spring Cherry (*Prunus subhirtella*)

hood of Tokyo and Yokohama where, however, its parent (*P. subhirtella* var. *ascendens*) is common in parks and temple grounds. So, too, is its sister with hanging pendent branches and pink flowers, well-known in gardens as the var. *pendula* or Rosebud Cherry. A curious and worthy relative is the var. *autumnalis* which is remarkable in flowering in spring and again in autumn. In habit it is very like the Spring Cherry but the flowers are semi-double. The Japanese call it the October Cherry, but some years this wayward plant flowers more fully in spring than in the autumn.

Another regal member of the family of Japanese Cherries is *P. incisa* which flourishes in the Arboretum alongside the Spring Cherry and opens its flowers at the same time. This Cherry is low of stature but of exquisite loveliness with nodding white or pale pink flowers and yellow anthers. The petals fall in a few days but the sepals and stamen-filaments change to vinous-red and persisting for a couple of weeks give the impression of apetalous flowers. Its home is the region round the famed Mt. Fuji and for this reason is called the Fuji Cherry. It is perfectly hardy and happy in the Arboretum, yet though known and named since 1784 it was not introduced into our gardens until early in the twentieth century. Why such a charming plant should have been so long neglected is a mystery. By Japanese gardeners it is much appreciated for it is the only Cherry that can be fashioned into the so-called

dwarf trees and made to grow and flower freely in small pots.

Head of a very numerous clan is the Sargent Cherry (*P. serrulata* var. *sachalinensis*) with white to rose-pink flowers each from 1 to 1½ inches across. The largest specimen in the Arboretum is 30 feet tall with a broad crown and a trunk 5 feet in girth. It was raised from seeds sent from Japan in 1890 by Dr. William S. Bigelow. This tree has unusually large and deeply colored flowers but unfortunately these are often much hidden by its expanding bronzy green leaves. A more shapely tree is that by the pond introduced from Hokkaido in 1892 by Professor Sargent. This specimen has pale colored flowers which are usually fully expanded before the leaves appear. This Cherry is one of the principal parents of the double-flowered Cherries of Japan, a collection of which may be seen on a grassy knoll of Bussey Hill. More slender of growth and with smaller flowers are the varieties *spontanea* and *pubescens*, several fine young trees of which grow on Bussey Hill and on Peters Hill. The autumn tints of these Cherries are very brilliant.

The stately Tokyo Cherry (*P. yedoensis*), of unknown origin and so abundantly planted in the city of Tokyo, and whose flowering is made the occasion of an annual holiday in Japan, is less hardy than others mentioned though it thrives on Peters Hill. Very fragrant are the small rose-purple flowers of *P. canescens*, the gray-leafed Cherry, of which no species has more



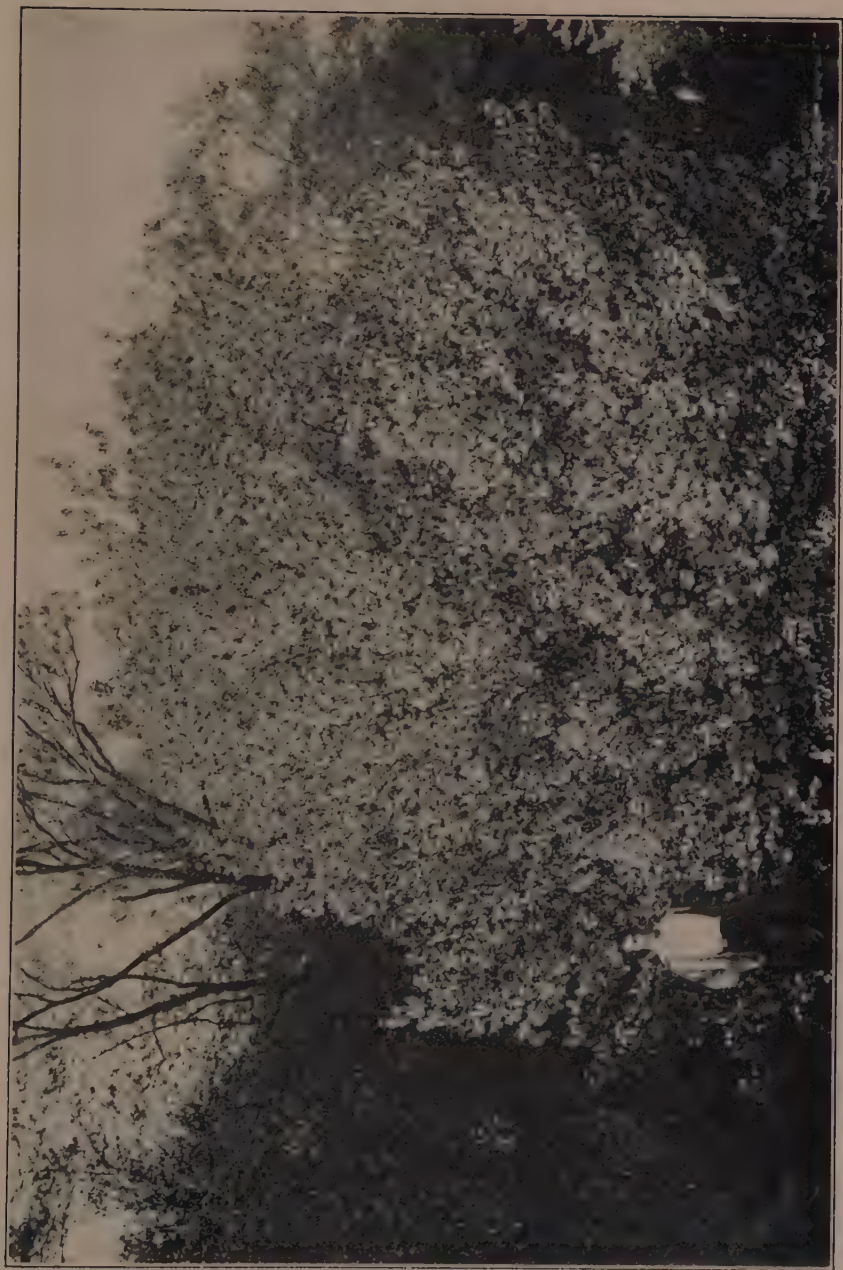
As crystal goblets hang the rose-like blossoms of the double Cherry albo-rosea

richly colored brown bark. This came to us from interior China and is worth growing for its bark alone. Delightful are the bushes of *P. tomentosa* with flowers opening from pink buds as the leaves unfold, their bright red stalk and calyx making a handsome contrast with the white petals often marked with pink. This is a very hardy and vigorous shrub from 5 to 6 feet tall and, when well grown, often broader than it is tall.

A noteworthy but rather distant relative of those already mentioned is Maack's Cherry (*P. Maackii*) which hails from northeastern Asia. This is a large tree with yellow-brown highly polished bark clothing the trunk and principal branches. The flowers are small and white, borne in racemes like those of the Bird-cherry, and the curious will note that the leaves on the under side are dotted with minute glands. A fine specimen of Maximowicz's Cherry (*P. Maximowiczii*), also native of northeastern Asia, is growing by the side of the pond just beyond the Sargent Cherry. A round-topped tree of pleasing habit, this Cherry has almost black bark and in autumn its leaves are wondrously tinted with orange and red. The flowers are small and white and produced on short erect racemes each blossom with a prominent cluster of stamens and subtended by a conspicuous green bract fringed with gland-tipped teeth.

To describe all the varieties of Cherries in the collection would entail much space and might prove tedious reading but the Gean (*P. avium*) and its double-flow-

ered form must not be overlooked. This native of Europe is one of the parents of our garden Cherries so widely grown for their delicious fruit and is a lofty tree of shapely habit. No Cherry has flowers of a purer white and the chaste loveliness of this tree is unsurpassed. The boughs of the double-flowered form are wreathed with pendulous masses of blossoms, each about $1\frac{1}{2}$ inches across with from 30 to 40 petals and in perfection of beauty lasts long. Keen observers will perceive in the centre of each double flower two folded tiny green leaf-like pistils. This peculiar feature may also be seen in some of the double-flowered Japanese Cherries such as the forms *fugenzo* and *albo-rosea*. To the Japanese these suggest peaceful Buddha seated in the heart of the sacred Lotus flower. According to Japanese folk-lore the Cherry-tree itself is a lovely princess, named Konohana Sakuya-Hime, reincarnate; the color of the flowers being that of the blushes which suffused the cheeks of this dainty, bewitching damsel. From this pretty legend is derived the name Sakura now universally applied to the Cherry-tree in Japan.



Crabapple opulence (Malus baccata)

Crabapple Opulence

D ID we ask our feathered friends the season of the Crabapples they would certainly answer the fall. And beautiful are these plants at that season laden with myriads of small brightly colored fruits. But in reality the Crabapples claim and must be granted two seasons: late spring for their blossoms, autumn for their fruits. The abundance of flowers and fruits produced by these plants is truly astounding and no tribe gives greater returns. Lovers of fresh breezes and sunshine and rugged of constitution, Crabapples are well suited to the rigorous climate of northeastern North America. Wherever the common Apple can be grown its brothers and sisters will flourish and many of them are able to withstand greater cold than our favorite fruit tree.

The flowering of the Crabapples is one of the most important events in the Arboretum's year. Each succeeding season this festival attracts an increasing number of visitors and it bids fair to rival that of the Lilacs in public esteem. The collection, which is one of the most complete in existence, is the result of fifty years of continued effort. It occupies two sites in the Arboretum. The older part is on the left just within the Forest Hills gate. The space here proved insufficient and the main collection is now on the right some two hundred yards within the Bussey Street entrance and

at the foot of the hill where grow the Hawthorns. Here with a grassy sward beneath them and woodland in the rear are grouped most of the known species, varieties and hybrids. The different species of Crabapples are found wild in this country, in Asia and in Europe. In the Arboretum they may be seen growing side by side and their comparative study is simple. The first to bloom are those from northeastern Asia, the last those of North America. The season of blossoming varies somewhat but generally commences about the first of May and lasts until the end of the month. The earliest fruits are ripe in September and in some kinds, unless eaten by birds, these remain fresh and brightly colored on the trees until the winter is far advanced.

Some of the Crabapples are trees of considerable size but most of them are small trees or tree-like bushes, while a few are low broad shrubs with their bottom branches resting on the ground. There is much variety in the arrangement of the main branches and in the shape of the crowns. In many the crown is broad, irregular and spreading, in some it is vase-shaped, in others it is bell-shaped and in a few it is narrow with strictly ascending branches. As a rule the branches are rigid, very numerous and intricately placed; more rarely are they sparse and somewhat zigzag in arrangement and in a few they are pliant and even pendent. The flowers of many Crabapples are rose-colored in the bud and nearly white in the fully expanded blossom; in some they are pure white, in others pale to



Crabapples garlanded with myriad blossoms (Matus Sieboldii arborescens)

deep pink, or even rosy purple. They are delicately fragrant in most of the species while in the American sorts the flowers have a distinct odor of violets. The fruit also is of different colors being yellow or bright to dull red in many, in some it is red on one side and yellow on the other, a few have dull greenish red fruits while the American species have green or yellowish fruits. The surface of the fruit may be polished and lustrous, or covered with glaucous bloom; or it may be sticky and clammy as in most of the native species which in addition have pleasantly fragrant fruits. It would be easy to add other points of interest but these will serve as a general introduction.

First to burst into bloom is the fragrant Manchurian Crabapple (*Malus baccata* var. *mandshurica*), native of northeastern Asia. This tree is one of the largest of its tribe and produces an abundance of pure white flowers, each rather more than one inch across and more fragrant than those of any other Asiatic Crabapples. In the Arboretum the largest specimen is about 18 feet tall and more through the crown, but in a wild state it is often more than 50 feet high with short thick trunk and a broad bell-shaped crown the lower branches of which sweep the ground. Its fruits, each no larger than a good-sized pea, are yellow or shining red.

The first known of the Oriental Crabapples is the well-named *M. spectabilis* with flowers of the purest to the palest pink and more or less semidouble. The

fruit is yellow, sometimes reddish on one side, and about three-fourths of an inch in diameter. This is a tree of moderate size with a vase-shaped crown of numerous rigid ascending-spreading branches and short branchlets. It has been in cultivation since before 1780 having been introduced into English gardens from Canton but its origin is still unknown. Years ago I saw fine specimens in the garden of the Summer Palace near Peking. In the Arboretum the finest trees of this species are in the old collection near some large Oaks. All who see them in the fullness of their blossoms, with the gray and red-tinted unfolding leaves of the Oaks above, will readily agree that this old favorite is worthy of an Emperor's garden.

Very accurately named and by some people considered the finest of the Asiatic Crabapples is *M. floribunda*. It is a broad, round-topped tree sometimes 30 feet tall and more through the crown, with a tangle of branches and masses of slender arching and pendent branchlets. The clustered flowers are white when fully open and bright reddish pink in bud and as they open in succession the contrast is singularly beautiful and pleasing. The fruit is small and not attractive in appearance yet the birds seem fonder of it than of any other Crabapple fruit. Though one of the best known, having been introduced into Holland from Japan in 1853, its real home and origin remains a mystery to Japanese and ourselves alike.



Exquisite is this pigmy of the Crabapple family (Matus Sargentii)

Yet another of mysterious origin is the lovely Parkman Crabapple (*M. Halliana*). This "Pink Pearl of the Orient" is a favorite among the Japanese to whom it is known as "Kaido," a translation of the Chinese name "Hai Tang" which signifies an Apple from across the sea. In ancient times the Shantung promontory was an island separated from the mainland by the various mouths of the Yellow River. The Chinese believe that this Crabapple originally came from that island of ancient times but they also give to most of their garden varieties of apples and pears the same birthplace. The botanist may greatly regret the lost facts in the history of this plant but laymen are content with a knowledge that it flourishes in New England. To American plant lovers this small tree has additional interest for it was first introduced into western gardens by Dr. George Hall who sent it from Japan in 1861. With other plants it passed directly into the possession of Francis Parkman, the historian, in whose garden on the shores of Jamaica Pond, Boston Mass., the plant flourished for many years. The trees in the Arboretum are direct descendants of the original introduction. The Parkman Crabapple is very distinct in many ways. In habit it is a tree-like shrub, sometimes 15 feet tall with a bushy crown of ascending-spreading branches and twiggy branchlets bearing rather sparsely dark green leaves which are relatively thick and deeply tinged with bronze color when they unfold. The flowers, each on a slender stalk, are borne in clusters and

are of the loveliest rose-pink color but the pea-like fruit, which ripens late, is greenish red and unattractive. The blossoms vary in forms from single to semi-double and the central one of each cluster is usually male.

Exquisite is *M. Sargentii*, the pigmy of the Crab-apple family with umbellate clusters of saucer-shape flowers of the purest white, in which nestles a tiny group of stamens with clear yellow anthers. It is a low, broad, densely-branched shrub which hugs the ground and is preeminently suited for planting on banks. The fruit is wine-red, covered with a slight bloom and persists on the plants throughout the winter. From the salt marshes of Hokkaido, the northernmost island of Japan, came this gem, discovered and introduced and fittingly named for the man who brought the Arboretum into being some fifty years ago and who, happily, still controls its activities.

Like a Hawthorn in foliage, the leaves being deeply incised and lobed, though some of them are quite entire, and fruit like a white-heart Cherry, is *M. toringoides*, a newcomer from the mountain fastnesses of the Chino-Thibetan borderland. With its clusters of white flowers produced with the unfolding leaves this small rather thorny tree is less attractive in blossom than many others, but its fruit is considered by many people the most beautiful of all the lesser Crabapples. This and the somewhat similar but smaller *M. transitoria* are the last of the Asiatic species to bloom.

Rigid of branch with wands of blossoms often 15 feet long the Chinese *M. theifera* is the very quintessence of Crabapple loveliness. It is a small tree, seldom exceeding 20 feet in height, with sparse, upright, spreading, rather zigzag branches which are densely studded from base to tip with short, flower-bearing spurs. When in blossom the whole branch is transformed into a fragrant floral plume into which it is impossible to thrust a finger without touching a flower. In color the petals are reddish pink in the folded bud, white or delicately stained with pale pink when fully expanded. The fruit is tiny, dull greenish-red and not showy. The specific name of this plant is derived from the fact that in central China, where it is a feature of the thickets and margins of woods on the mountains, the peasants collect and dry the leaves and from them prepare a palatable beverage which they call red tea.

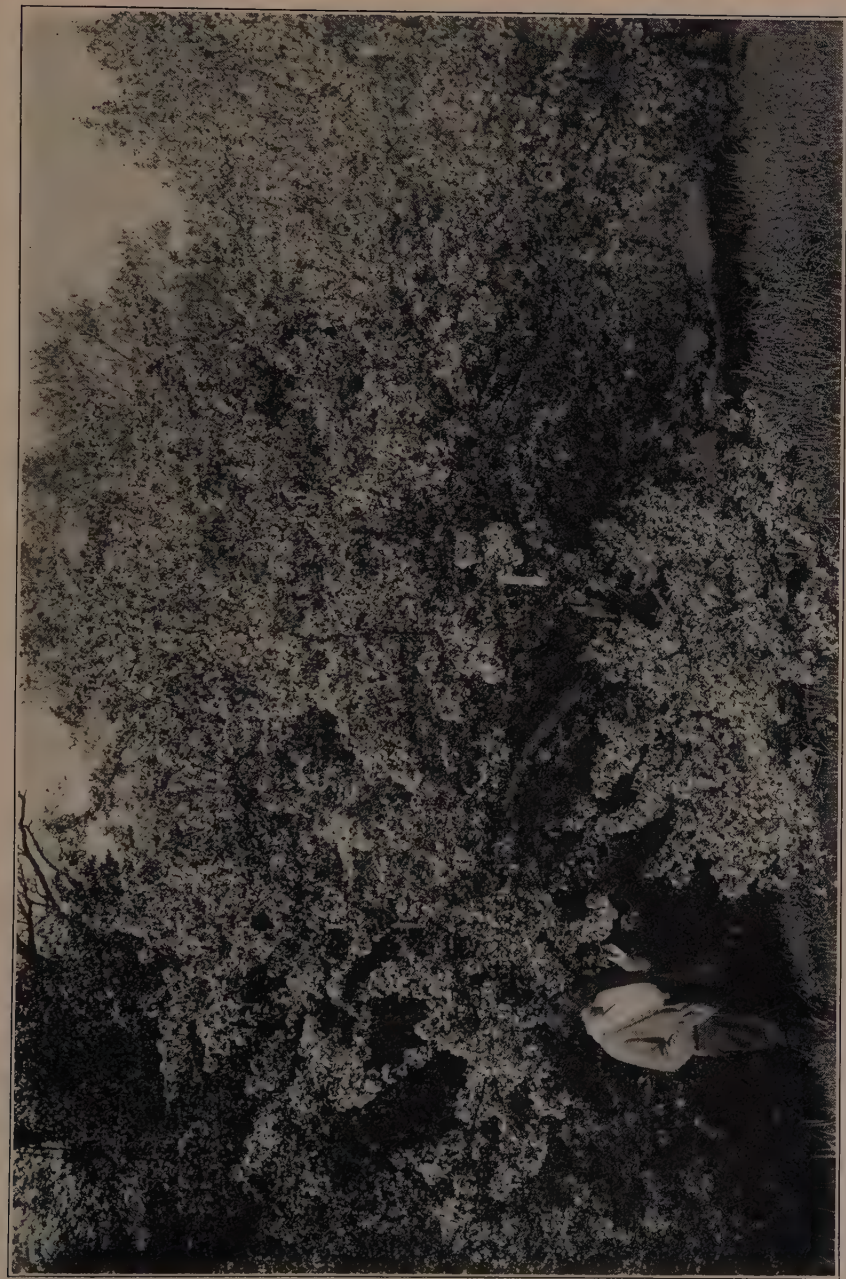
The American Crabapples have white or pink fragrant flowers which do not open until the leaves are partly or entirely grown, and green and pale yellow, fragrant fruits which hang from slender stalks and, with the exception of that of northwestern, *M. fusca*, are depressed globose, usually from one to two and a half inches in diameter and covered with a waxy secretion. All the species are small trees which spread into thickets and are excellent plants for the decoration of glades and woodland borders.

One that attracts greatly the attention of garden-lovers is the double-flowered Bechtel Crab (*M. ioensis*

var. *plena*) whose pale pink blossoms look like small roses. The flowers are two inches and more across with a delicate odor of violets and produced in the utmost profusion. There is one tree in the old collection and others in the new collection and when covered by their garlands of blossoms these are among the most popular trees in Arboretum. It is a natural variety, the original plant having been discovered wild about 1850 northeast of Staunton, Illinois, though it was not until about 1888 that it was introduced into cultivation by E. A. Bechtel of Staunton.

When all other Crabapples have shed their flowers and the fruit of many is developing *M. angustifolia* unfolds its leaves and bright pink blossoms. This species is a native of Virginia and other southern states and is a tree sometimes 30 feet tall with wide-spreading rigid branches and spiny branchlets forming a flattened crown. The flowers, each about an inch across, are freely produced and more fragrant than those of any other Crabapple. Though its home is in the warmer States this tree is quite hardy in the Arboretum where good examples may be seen.

Chosen at random I have sketched a few of the features of the Crabapple collection. There are many others of equal and some may think of surpassing merits. In the collection will be found wild forms of the Common Apple, also the parent of the Apples grown by the Chinese and Japanese before they knew anything about the apples of Europe and America.



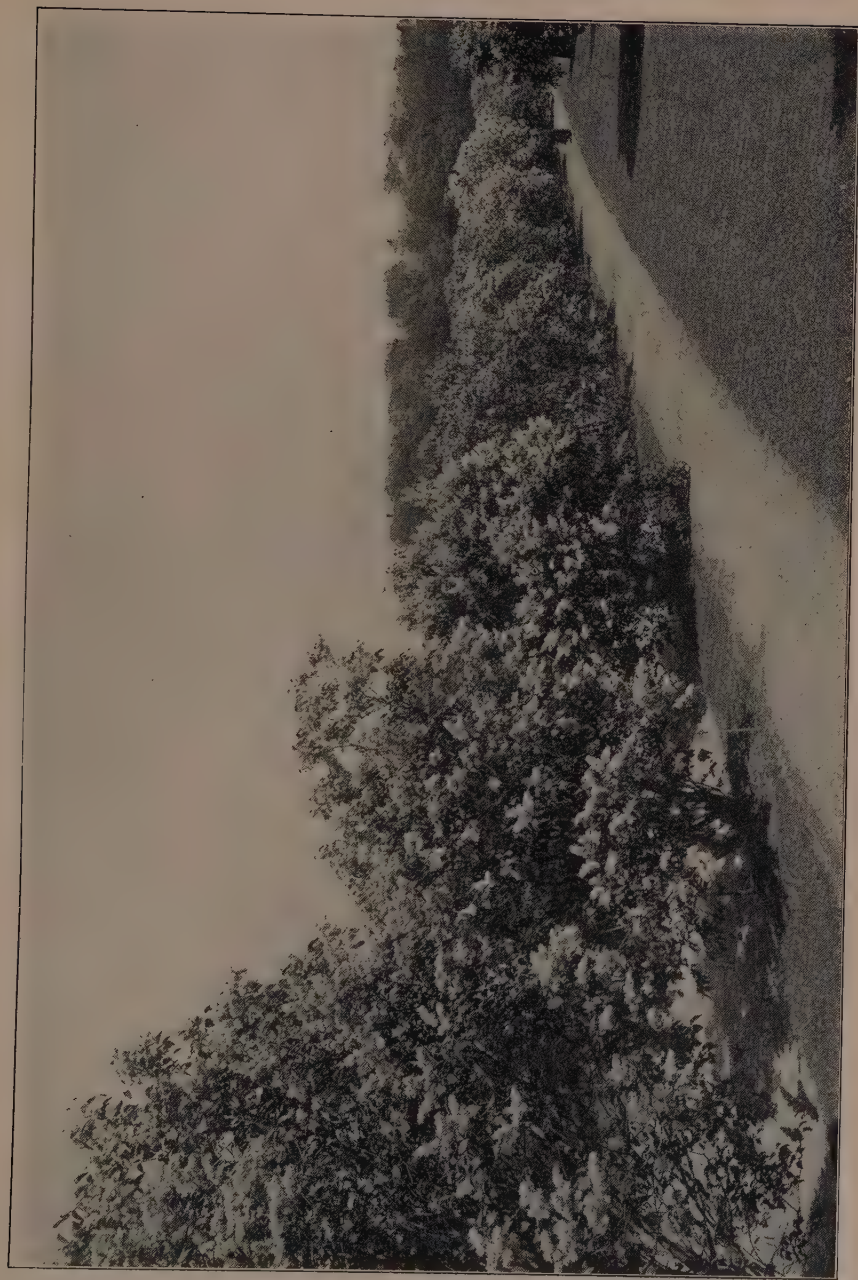
"Beauty indescribable, charm irresistible—come to the Arboretum in Crabapple time"

Likewise, hybrids between the Common Apple and certain American species bearing large fruits, and many hybrids and forms of the various Oriental Crabapples, some with fruit no larger than a good sized pea, others with fruit an inch in diameter. Finest of all the larger fruited Crabapples is the tall and handsome *M. sublobata*, an Asiatic hybrid of unknown origin with bright yellow fruit an inch through.

There are Crabapples suitable for the lawn or park, for steep banks or edge of woodlands, for open places or forest glades; Crabapples garlanded with myriad blossoms in the spring; Crabapples brilliantly jewelled with countless fruits in autumn. Crabapples whose scented flowers are my lady's delight; Crabapples whose characteristics are the artist's joy; Crabapples whose wholesome fruit makes delicious preserves; Crabapples whose tiny fruits save our feathered friends from starving in the depth of winter. Their beauty is indescribable, their charm irresistible. Come to the Arboretum at Crabapple time.

Lilac Time

LET us go to the Arboretum! The Lilacs are in bloom and the air is filled with delightful fragrance. The days are pleasantly warm and it is good to wander among the Lilacs in the fullness of their beauty. The Lilac holds a peculiar place in our affections and in no other flowering shrub is the spirit of home more closely entwined. Go where one will in New England bushes of the Common Lilac may be seen in close proximity to homes and often they are all that are left to mark the site of old homesteads. It is a long-lived accommodating shrub thriving in all sorts of queer places, often under very adverse conditions. However, it likes good soil and lime is a relish it greatly appreciates. No other shrub is so popular and "Lilac Sunday" draws the greatest crowd of people to the Arboretum. To most of us the Lilac is a bush with purple or white flowers whose fragrance haunts old-fashioned gardens. This plant is the *Syringa vulgaris* of botanists cultivated in Europe since the end of the sixteenth century and in this country from the days of early settlers in New England. Its real home is the mountain valleys of Bulgaria but this fact has only recently become known. This plant and its numerous varieties are preeminently suitable for gardens in the colder parts of this country where they thrive exceedingly. Most of the species of Lilac are



Lilac Time

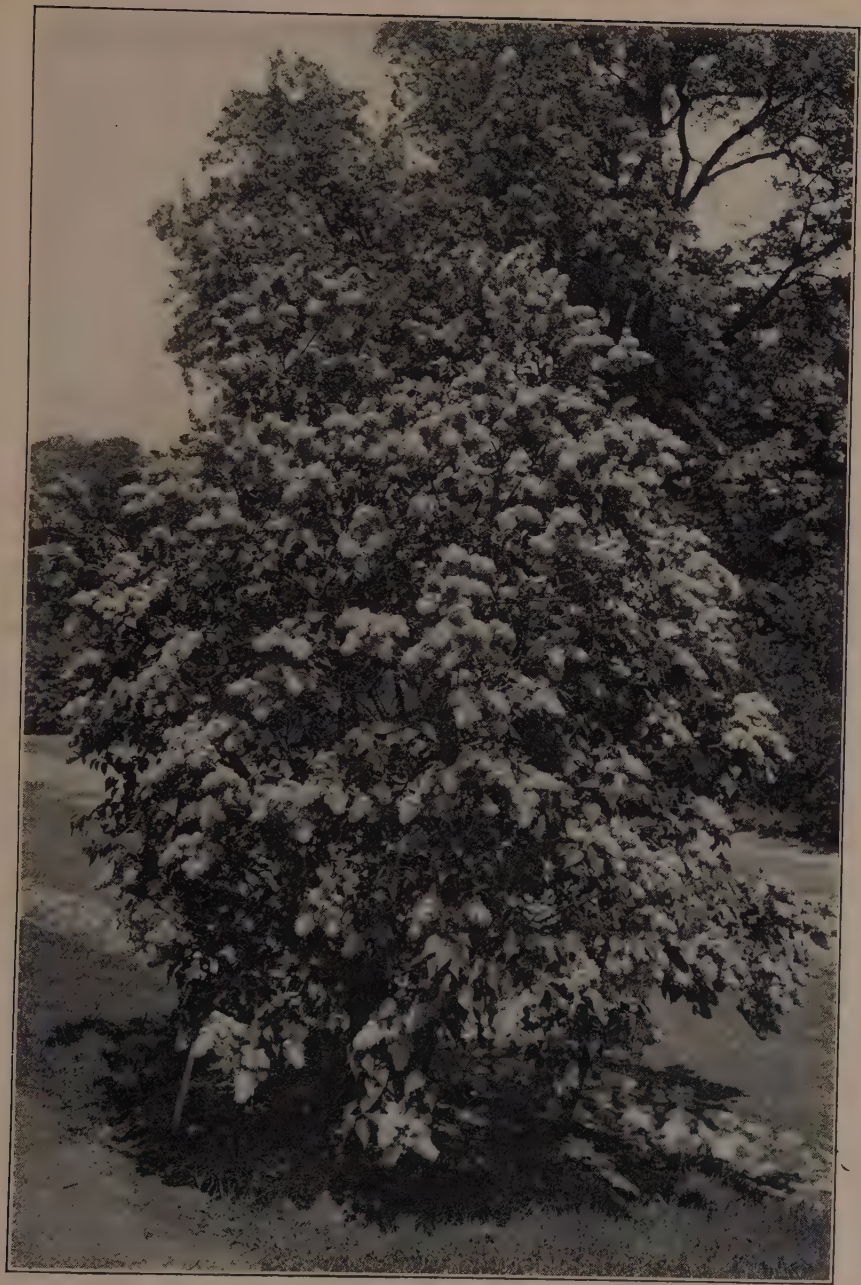
natives of China and Korea, one species is peculiar to Japan, one to the western Himalayas and one to Afghanistan; two are European, one being found in Hungary and another in Bulgaria. None are indigenous in America but notwithstanding this all the species introduced have proved hardy in the Arboretum. A singular and most interesting fact.

The Lilac collection is grouped on a hillside on the left of the Forest Hills road immediately beyond the tangle of Golden-bells (*Forsythia*). In this collection there are upwards of one hundred and ninety named varieties of the Common Lilac, nearly all the known hybrids and twenty-seven out of the thirty recognized species. It is doubtful if any other collection in the world is so complete and, moreover, twenty-two of the species have been introduced into cultivation in America by the Arboretum.

There are bushes great and small, some babies only a few feet high, others lusty giants full fifteen feet tall. Lilacs with snow white flowers; Lilacs with pink flowers; Lilacs with red and purple flowers; Lilacs with blue flowers and Lilacs with flowers of every known shade of purple. Lilacs with single flowers; Lilacs with double flowers; Lilacs with flowers in erect broad trusses a foot and more high. Lilacs with flowers more than one inch in diameter; Lilacs with delightfully fragrant flowers; Lilacs with scarcely any scent and all descended from one species, the Common Lilac (*S. vulgaris*). In one bed may be seen three plants of

the ancestral type raised from seeds gathered from wild plants discovered in Bulgaria in 1896. These bear narrow clusters of dull purple flowers and are out-classed in beauty by their descendants. Around these humble parents are grouped the choicest products of the skill of Lemoine and other plant-breeders. The contrast is amazing and is a superb illustration of the immense possibilities potential in the most homely subject. Some declare that there are too many named sorts of the Common Lilac and that the differences are often so slight as to be almost absent. There is much truth in this but such critics can, to their hearts' content, from the Arboretum collection select the dozen or so sorts they prefer and consider most distinct. But to the rank and file the abundance of blossoms is a joy so great that criticism cannot for an instant live in our thoughts. We are content to walk among, under and above the Lilacs delighting in their beauty, their fragrance, their prodigality of blossoms, deeply grateful that such loveliness has been brought together in one place for our enjoyment.

Dominant it may be but the Common Lilac and its hundredfold progeny by no means exhaust the treasures of this collection. Others command our admiration and some possess even greater elegance. None can resist the charm of the so-called Persian Lilac (*S. persica*). This is a broad shrub of moderate height with slender drooping wide-spreading branches, narrow leaves and small fragrant, lavender-colored flow-



Lilac bushes of great size weighted down with blossoms (Congo)

ers borne hundreds together in compact clusters. There is a variety (*alba*) with white flowers and another (*laciniata*) with deeply incised leaves. It is in fullest blossom when the Common Lilac is past its best and no sort flowers more profusely. This perfectly hardy gem was cultivated in England as long ago as 1658 but it is now much too seldom seen in gardens. It was named by Linnaeus and for centuries universally believed to be a native of Persia. That it has from early times been a favorite garden plant in Persia is certain but there is no evidence to prove that it is indigenous in that country. On the contrary it seems to be of Chinese origin. In 1915, the late Frank N. Meyer found a Lilac covering whole hillsides in Kansu, north-western China. Plants raised from seeds of this Lilac have flowered in the Arboretum and proved identical with *S. persica*. Moreover, they have produced both lobed and entire leaves and are in every way indistinguishable from the plant so long grown in gardens under the name of Persian Lilac.

Most fragrant of all Lilacs is *S. pubescens*, a tall shrub with erect stems, small hairy leaves and broad clusters of pale mauve-pink blossoms with violet colored anthers. The flower has a long slender corollatube and its odor is more pleasing than that of any other Lilac. It is native of northern China and is one of the very earliest to bloom each year. The plants in the Arboretum are the original introductions into this country and flowered for the first time in 1886.

They were raised from seeds sent from Peking in 1882 by Dr. Bretschneider, a Russian savant of illustrious memory.

Other heralds of Lilac-time are *S. affinis* and *S. oblata*, both tall shrubs, the first of ungainly habit from northern China. Each succeeding year in the Arboretum it is a close race between the two and usually the first-named wins. So eager are they to burst into bloom that often the expanding flowers are nipped by late frosts. Their garden value is less than that of many other Lilacs but their leaves, which are broad, leathery in texture and particularly handsome, turn to a deep bronze-red or wine-color in the autumn.

When the lustre of early and midseason Lilacs is dimmed rises that of *S. villosa*, another north China plant which America owes to Dr. Bretschneider and the Arboretum. This is a large shrub from ten to twelve feet tall and wide, compact in habit with stout branches and large oblong pale green leaves. The flowers are flesh-color, and are borne in erect clusters but unfortunately their odor is disagreeable. This is one of the hardiest of all Lilacs and a very conspicuous ornament in the collection. Very similar to this in habit and foliage is *S. reflexa* but it differs from all other Lilacs in its broad, pendent clusters of dark rose-colored flowers.

The last of its class to blossom is the comparatively new *S. Sweginzowii* which is a native of northwestern China. It is a tall sparsely branching plant with long



None is more winsome than the *Persian Lilac* (*S. persica*)

narrow clusters of delicately fragrant flowers flesh-pink in the bud and pure white when fully open. Not content with producing an abundant crop of blossoms in early June the dainty *S. microphylla* blooms freely again in late September or early October. This is a low broad shrub with slender stems, small leaves and pale, lilac-colored flowers introduced by the Arboretum from north-central China.

Hybrid Lilacs are much less numerous than are forms of the Common Lilac but among them in the Arboretum collection there are several lovely kinds. The oldest Hybrid Lilac and one of the brightest jewels of Lilacdom is the Rouen Lilac which appeared in the Botanic Gardens at Rouen in 1795. It is a hybrid between the Common Lilac and the Persian but through an error as to its origin it has the misleading name of *S. chinensis*. This is one of the most vigorous of all Lilacs and in its habit of growth, its slender branches, its small leaves and flowers it resembles its Persian parent while the color of the flowers shows the influence of the Common Lilac. Its massive flower clusters are of enormous size, often two feet long and so heavy as to weigh down the branches.

Only a few of the treasures have been mentioned and many visits to the Arboretum are necessary to see all the varieties of Lilac in blossom. The season lasts a full six weeks and after the true Lilacs have finished flowering the Tree Lilacs burst into bloom. There are three species of these named *S. amurensis*, *S. pekin-*

ensis, and *S. japonica*, all natives of northeastern Asia. They are small trees with large much-branched clusters of white flowers of unpleasant odor. They differ from the true Lilacs in having a short corolla-tube and protruding stamens. With their abundant broad clusters of snow-white flowers they are very striking and noteworthy members of the collection. The wood of *S. japonica* is very durable in the ground and for this reason it is esteemed above that of other trees by the Ainu people of north Japan for making their inaos or wooden wands used in religious and ceremonial purposes. These wands are regarded as permanent guardians against disease, evil spirits and dangers of all kinds.



Azalea Carnival: the fragrant Pinxterbloom (Azalea nudiflora)

Azalea Carnival

AZALEAS have been very extensively planted in the Arboretum and from the end of April until mid-July produce a gorgeous display of color. The collection proper is on the western slope of Bussey Hill but there are groups among the Oak collection, and clumps here and there by the road-sides and by the edge of ponds.

As arranged in the Arboretum the Azaleas give arresting bits of color in all sorts of unexpected places. Here and there a flame of orange or red, a patch of yellow, a drift of pink or a sheet of the purest white compel admiration. In some places hidden among other bushes their pungent fragrance leads a visitor to the discovery of isolated plants of the Pinxter Flower or Swamp Honeysuckle. Azaleas lend themselves to all sorts of surprises and add alluring interest to a stroll through the grounds. Looking from vantage points on the Valley Road and Hemlock Hill Road toward Bussey Hill through vistas of Oak and Beech a blaze of brilliant color fascinates the beholder. Here are flaming drifts of blossom, a vision of ecstatic delight, such a scene as fancy associates with tropic lands. Flora is here, dressed in her gayest robes steeped in honeyed scents, voluptuous, alluring irresistible.

The two great regions of the world that have supplied the Arboretum with its Azaleas are eastern North

America and northeastern Asia. There are several Azaleas which have their home in China, there is one in Asia Minor and parts of Europe, and two in western North America but none of these are properly hardy in the Arboretum; neither are the "Ghent," "Mollis" and other hybrid races raised in Europe during the last century. As compensation, however, is the fact that the species of northeastern Asia flourish here far better than they do in Europe. Indeed they are happy in the Arboretum as on their native heath.

First of the Azaleas to burst into blossom is *A. mucronulata*, native of Korea and other parts of northeastern Asia. This is a shrub of loose branching habit with rigid, twiggy stems thickly crowded with clusters of rose-colored flowers. The leaves are dotted with tiny glands and when crushed emit a pleasant fragrance; in the autumn they change to yellow and bronzy crimson. Seldom exceeding six feet in height this Azalea is partial to dry and stony situations and thrives beneath the old White Pine-trees on Bussey Hill.

Of singular elegance and charm is *A. Vaseyi* with star-shaped pure pink flowers. Rather sparse in habit it loves a moist situation and is happiest near a pond or stream where tall Willows or other deciduous-leaved trees break the sun's rays and the waters reflect its beauty. Though restricted in a wild state to the higher mountains of western North Carolina it is perfectly hardy as far north as Massachusetts. The typical form has pink flowers but there is also one with



The very quintessence of loveliness is *Azalea mucronulata*

pure white blossoms. Vying with Vasey's Azaleas in the pink purity of its blooms is *A. Schlippenbachii* whose loveliness is beginning to be noised abroad. This has broad-funnel-form, fragrant flowers each from $2\frac{1}{4}$ to 3 inches across produced in terminal clusters, usually in late May before the leaves unfold. It is a sturdy bush with rigid twiggy branches and I have seen it as much as 15 feet tall though usually it is less than half this height. The leaves, obovate, from 3 to 4 inches long, in the autumn change to yellow, orange and crimson. Known from two isolated mountains in north Japan and one or two localities in northeastern Manchuria, it is one of the commonest shrubs in Korea where in thin woods it is often the dominant undergrowth. On some of the mountains it is extraordinarily abundant, presenting in June a wonderful sight of mile upon mile of drifts of purest pink. In Korea, through thin woods of Oak with gray and rose-tinted unfolding leaves, I have walked for hours among myriad blossoms of this beautiful Azalea.

Familiar to many is *A. nudiflora*, the Wild Honey-suckle or Pinxter Flower wide-spread in this country from Massachusetts southward. This is an excellent garden shrub growing from 2 to 6 feet tall, densely set with thin branches and bearing in profusion clusters of fragrant flowers, pale to crimson-pink in color with lobes spreading from a slender hairy tube and exerted stamens and pistil. It thrives in any situation and

never fails to put forth a wealth of sweetly fragrant blossoms.

Two other American species with pink and rose-colored flowers are the closely related *A. rosea* and *A. canescens*. The first-named is the most northern of native Azaleas being found from southwestern New Hampshire, central Vermont and southwestern Quebec south, while *A. canescens* is not found north of the Piedmont region of North Carolina. Both are broad irregularly branching shrubs from 4 to 15 feet tall with fragrant tubular flowers opening before the leaves unfold.

About the end of the first week in May, *A. poukhanense* commences to blossom. This is the common Azalea of Korea from the central parts south and was first introduced into cultivation by the Arnold Arboretum as late as 1905. In gardens it is a densely branched rounded or flat-topped shrub from 1 to 4 feet tall and more through, with terminal heads of rosy purple flowers rich in delightful fragrance. It is partly or wholly deciduous and in the autumn the leaves are tinted orange to crimson.

A Japanese species with rich magenta colored flowers is *A. rhombica* which varies in habit from a low twiggy flat-topped bush scarcely a yard high to a tall loosely branched shrub 18 feet tall. Placed by itself with a foil of dark evergreen behind, this Azalea in blossom is strikingly handsome.

For vividness of color and spectacular beauty *A. Kaempferi*, *A. japonica* and *A. calendulacea* must be granted pride of place. In the Arboretum may be seen broad masses of these Azaleas and in late May and early June these are amazing sheets of brilliant, flaming color which illuminates the landscape. From every vantage point they compel attention and visitors are irresistibly drawn toward them.

Kaempfer's Azalea is the common Mountain Azalea of Japan, where it is abundant from the extreme south far into the northern parts of the country, emblazoning the wayside and mountain slopes from sea-level to 4000 feet altitude. It is a twiggy, much-branched shrub from 3 to 10 feet high, with unscented flowers varying in color from salmon to rich red. The flowers last long and are seen to best advantage when growing in the partial shade of conifers and other evergreen plants. In full sun their brilliance pales, the colors bleach and the blossoms fade more quickly. In Massachusetts this plant is wholly deciduous but further south the leaves are retained through the winter. Though discovered late in the seventeenth century this Azalea was not brought into cultivation until 1892, when Professor Sargent sent seeds to the Arnold Arboretum. It has proved perfectly hardy, extraordinarily floriferous and is among the most valuable of all exotic plants.

More sturdy of habit, with rigid, ascending stems, is *A. japonica*, also wide-spread on the mountains of

Japan. This has broad, funnel-shaped flowers, each about 2 inches across, sweetly fragrant and aggregated 6 to 12 together at the end of every shoot. The color varies from orange to flame-red or almost pure red, and there is a form (*aurea*) with soft yellow blossoms. At its maximum this is a shrub 10 feet tall and 5 feet through but more usually it is from 4 to 5 feet high and as much in diameter. Vigorous of habit, free-flowering and perfectly hardy, this handsome Azalea deserves the widest possible recognition.

The third of the group is the Flame Azalea of the Appalachian Mountains and right well does it merit the name, for it is one of the most gorgeous of all American shrubs. All who have seen it growing wild extol its beauty and we who know it in gardens are captive to its brilliance. The colors range from yellow through orange to scarlet and the flowers, which have little or no fragrance, open with or immediately after the unfolding of the leaves. This Azalea grows naturally in open woods and by the side of water courses and may be of any height from 4 to 15 feet and as much through. In gardens it is not particular in the matter of site but massed on a bank or in thin Oak woods, as planted in the Arboretum, it is most effective.

Before the last flowers of the Flame Azalea have fallen, those of another Appalachian species (*A. arborescens*) commence to open in the Arboretum. This is one of the loveliest of all the American Azaleas, with large, fragrant flowers, pale rose-color in the buds



A study in pure pink—the Oriental Azalea Schlappenbachii

and the purest white, when fully expanded. The stamens and pistil are exerted far beyond the spreading lobes of the tubular flowers and being of a bright, red-crimson color, add much to the beauty of the blossoms. This is a much-branched shrub, from 8 to 15 feet high, with dark green leaves, lustrous above and pale below and with an odor of newly-mown hay. Unlike the last-named species the leaves of this *Azalea* and those of *A. viscosa* are fully grown before the flowers appear.

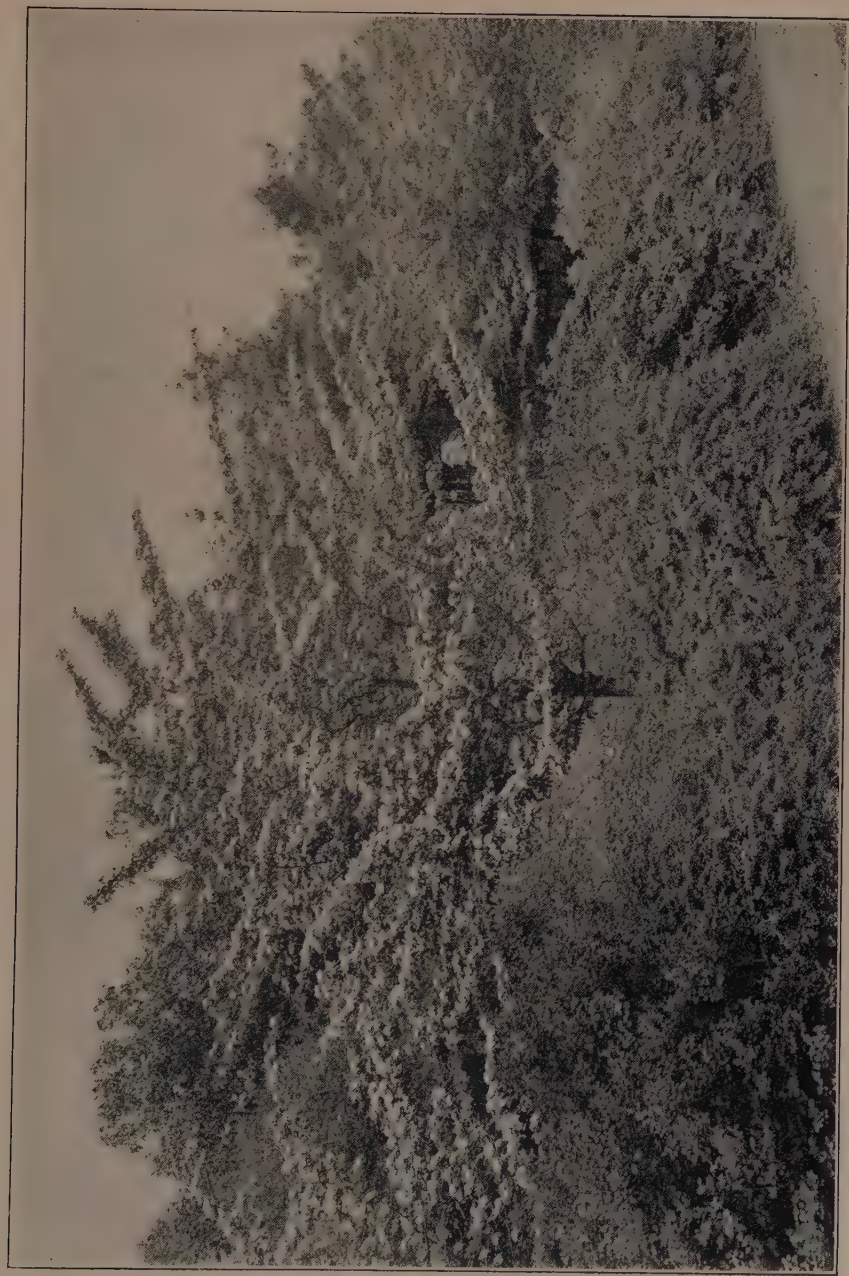
Carrying the *Azalea* season well into July and last of all to open its flowers is *A. viscosa*, the Swamp Honeysuckle. This is an inhabitant of the swamps of the eastern part of this country, from southeastern Maine to South Carolina. An irregularly branching shrub from 3 to 15 feet tall, this *Azalea*, as a garden plant, is valuable for the delightful fragrance of its long-tubed, clammy, viscid, pure white flowers and for their lateness.

As we have passed the different kinds in review their individual characteristics have been pointed out and appraised but it is the extravagance of color and wealth of blossom that impresses first, last and all the time. Color among flowers is like movement in animals, a virile expression of life. If this analogy be admitted, then *Azaleas* are rich in animation and vivacity.

Let garden-lovers attend what feast they may, none will be found more replete in beauty and fragrance than the festival of *Azaleas* held annually from early May to mid-July in the Arnold Arboretum.

The Hawthorns

THE collection of Hawthorns in the Arboretum is a good illustration of the industry and pertinacity of the institution. The main collection occupies the major part of Peters Hill from base to summit; trees, singly or in clusters, grow by the roadsides in many places, a group surrounds the summit of the Overlook and a broad belt flanks the parkway side of the Shrub Garden. A full thousand of these plants add the beauty of their blossoms and fruits to the Arboretum's landscape. The great majority of these Hawthorns are natives of North America, where much attention has been given to the genus during the past twenty-five years. The oldest specimens in the Arboretum are those bordering the vine trellis in the Shrub Garden, which were raised from seeds sown about 1880. When, fifteen or twenty years later, they began to flower, it was seen that many of them were unlike any of the known species. This fact led to the general study of American Hawthorns, which has been carried on at the Arboretum continuously ever since. During these years more than four thousand four hundred lots of seed, collected from special plants wild in different parts of the country, have been planted and tens of thousands of seedlings have been raised and distributed. A set of these seedlings has been planted on the eastern slope of Peters Hill and proper space



*Rich in variety of form are the snowy blossomed Hawthorns (*Crataegus punctata*)*

given to each to develop its full proportions and beauty. The work has been conducted with scrupulous care. Twenty of the twenty-two natural groups, in which the American species are arranged, are now largely represented in the collection. Most of the Old World Hawthorns are well established and some three hundred and fifty American species flower and ripen their fruit on Peters Hill every year. Nowhere else in the world can such an extensive group of a single genus of hardy trees and shrubs be found for study. To the man who has labored so assiduously in the investigation of the genus and in the formation of this unique collection, our indebtedness as the years roll on will of a surety receive full recognition. For this, among other good works, the name of Professor Charles S. Sargent will ever be held in grateful remembrance by those who love trees.

The Hawthorns are all referred to the genus *Crataegus* by botanists and a strong family resemblance in flower and leaf pervades the whole family. Members differ in habit of growth and length of thorns and greatly in size and color of fruit. The flowers of all the species are white, but their size and number in the clusters differ as do the number of stamens and color of the anthers, and these characteristics are used by experts to distinguish the species. In their fruit the Hawthorns have a wide range of variation in color, size, time of ripening and in their length of persistence on the trees. It is edible in all the

species though in three or four only is it of comestible value.

One Hawthorn only, with comestible fruit, is hardy in the Arboretum. This is a native of continental northeastern Asia named *Crataegus pinnatifida*, from its deeply incised foliage. In northern China, Manchuria and Korea it has been cultivated as an orchard fruit for we know not how many centuries, with the result that forms such as the variety *major*, with fruit more than an inch in diameter, have appeared. On the Overlook there is a tree of this variety 12 feet tall, with pale gray-green bark, large, lustrous green, deeply-lobed leaves inclined to be pendent, many-flowered clusters of very large flowers and oblong to flattened-round, crimson fruits.

A number of Hawthorns have yellow fruit. Of these *C. flava*, a small tree of about 20 feet in height and more or less pear-shaped fruit, may serve as an example. This is the type of a section comprising many species, all native of southeastern United States and characterised by the presence of conspicuous glands on the mostly obovate-cuneate leaves, petioles and corymbs and by the few-flowered clusters.

Among the Hawthorns with orange-colored fruits none is more handsome than the central Asian *C. Wattiana*. This is a tree of moderate dimensions with bright green, ovate, sharply incised leaves and clusters of translucent hanging fruits which ripen during the last week in August. The flesh is soft and the fruit in



Hawthorns add beauty of flower and foliage to the Arboretum's landscapes (*Crataegus fecunda*)

appearance is as tempting as a grape, but it soon wilts and by the middle of September has either fallen or hangs shrivelled and dried upon the trees. Quite a number of Hawthorns have lustrous black fruits but they are of lesser ornamental value though many are large and handsome trees. Of this group *C. rivularis* from the southern Rocky Mountains and *C. Douglasii* of the Puget Sound regions of western North America, serve as excellent types. Both are trees up to 40 feet tall with rather fluted trunks clothed with gray bark. The first named is fairly pyramidal in habit, whereas Douglas' Hawthorn has a rounded crown.

One of the most widely known of American Hawthorns is *C. punctata*, which has fruits of various colors. On some trees it is red, on others yellow, orange or rose-color. This species is very widely distributed in eastern North America and is a tree from 25 to 35 feet tall with a flattened or rounded crown of wide-spreading branches sometimes 40 and more feet through. It is peculiar in the fact that some individual trees have flowers with yellow and others with rose-colored anthers; the trees with yellow anthers produce yellow fruits and those with rose-colored anthers, red fruits.

The great majority of Hawthorns have red fruits varying from dull red through shades of scarlet to the richest crimson, while some have, in addition, a purple bloomy covering. It is these red-fruited kinds that are the most ornamental and desirable. To this

great group belong *C. monogyna* and *C. oxyacantha*, common throughout the greater part of Great Britain and so familiar in cultivation that any description is superfluous. There are many named sorts of both species and among them forms with red flowers, both single and double, a feature unknown among all the other vast array of Hawthorns. Few trees are more appreciated than Paul's Double Scarlet Thorn and richly does it deserve the honorable place it has won in the affection of garden-lovers. Another form (*alboplena*) has double white flowers, another (*pendula*) is of weeping habit, another (*stricta*) has erect branches. The Glastonbury Thorn (*C. monogyna* var. *praecox*) around which pretty legendary lore has gathered is remarkable in flowering in November and December. The fruits of these Hawthorns are less brilliant in color than those of many other species but the variety *Gireoudii* with lustrous red oblong fruit is exceptionally fine.

Of American red-fruited Hawthorns, the first to ripen its fruits is *C. arnoldiana*, a small tree with a broad crown of ascending and spreading branches and slender, very zigzag branchlets. The fruit is as large as a cherry, bright crimson and is abundantly produced. From mid-August until mid-September this is one of the conspicuous trees in the Arboretum. A closely related species with equally large fruit, which ripens about mid-October, is *C. arkansana*. Very beautiful in fruit in late September until the middle of November



*Through the winter and late into spring the shining, scarlet, bead-like fruits hang on the Washington Thorn (*Crataegus cordata*)*

is *C. succulenta* with its wealth of bright scarlet, globose fruits in drooping clusters. A round-topped, densely branched tree is *C. coccinioides* with bright orange and scarlet autumn foliage and erect clusters of shining crimson fruits, which ripen and fall during the month of October. Another species with orange-red fruit is *C. aprica*, a slender tree some 20 feet tall, native of the low valleys of southern Appalachian region. Handsome in flower and fruit is the broad-crowned *C. rotundifolia*, the most northern in its range of all the American Hawthorns. Well-known is *C. crugalli*, the Cockspur Thorn, with its formidable spines, rigid, spreading branches and drooping clusters of sub-globose, dull red fruits, which ripen in late October and remain on the branches until spring. This is the type of a large and well-defined group of which other worthy representatives are *C. fecunda*, with orange-red fruit, and *C. macracantha*. The last is most appropriately named for it has the longest spines of all the Hawthorns, and so thickly set on the branches are they that no animal will face the tree or break through a hedge formed of it. The Rochester Thorn (*C. durobrivensis*) is especially valuable for the garden in winter because its large dark crimson fruit remains uninjured by frost until long past mid-winter. Another species which holds its fruit late is *C. pruinosa* with a purple bloom. But of all the late-flowering kinds none excel *C. cordata*, the Washington Thorn, and *C. nitida*. The first-named has been known in cultivation

since 1738 and is one of the most distinct of all. It is a slender tree from 20 to 35 feet tall with a small and shapely crown, nearly triangular leaves which turn bright scarlet at the end of October. It is one of the latest to open its flowers and its small lustrous scarlet fruit in clusters remains on the trees until spring, with little loss of beauty. Very different in habit is Sargent's *C. nitida*, native of the bottomlands of the Mississippi River with wide-spreading lower branches and erect upper branches forming a broad, rather open, unsymmetrical head. It is a tree often 30 feet tall with a straight trunk and carries its shining scarlet fruit in abundance right through the winter. King Frost cannot dim the lustre of its myriad fruits which illuminate the landscape during the dreariest days of February.

Oaks and Hickories

A FAVORITE walk of mine in the Arboretum is the Oak Path leading from a point on the Meadow Road nearly opposite the Centre Street gate and joining the Azalea Path on the southern slope of Bussey Hill. This walk leads past some of the first Oaks planted in the Arboretum. Beautiful views toward the west of the Juniper dell and the Hemlock grove are obtained from it and it passes by some of the finest Azalea groups. It is a cool and shaded walk in the summer and in the autumn canopied by vivid autumnal foliage. I think, however, I like it best in the springtime when the Oak leaves are unfolding in soft grays, pinks and varying shades of red. At this season the northern Oaks can be studied to advantage for the color of the very young leaves and the amount and character of their hairy covering is different on every species. These vernal characters are constant from year to year and it is easier to distinguish, for example, a Black Oak from a Scarlet Oak, by the unfolding leaves than it is by the mature leaves.

The Oak is of all trees most dear to us northerners and is celebrated in our literature from earliest times. The genus to which it belongs (*Quercus*) is widely distributed, reaching the Equator in Asia, but the species with deciduous foliage are northern, and many of these Oaks are unsurpassed in beauty, size and state-

liness among the trees of the whole world. Yet comparatively little attention has been paid to them in planting ornamental trees. Oaks have the reputation of growing slowly and owing to this reputation have been neglected by planters. Experience in the Arboretum has belied this reputation. The oldest Oaks which can be seen from the Oak Path were planted fifty years ago when they were seedlings only a few inches high. The largest of them are taller with thicker trunks than other hardwood trees like Hickories, Walnuts, Elms, and Maples, planted at about the same time. The tallest of the planted Oaks in the Arboretum are Pin Oaks (*Quercus palustris*) and the tree with the thickest trunk is a hybrid between the White and the Bur Oaks called *Q. Bebbiana*.

The Arboretum is situated too far north to make possible here a very varied collection of Oaks. Of the fifty-five species which are trees and grow naturally in the United States only seventeen have been established in the Arboretum. Among the Oaks which are shrubs and not trees only *Q. prinoides*, the Chinquapin Oak, is properly at home. A few of the Rocky Mountain shrubby species just manage to exist but none give promise of success. No evergreen Oak can withstand this climate and the deciduous Oaks of Europe, except the Hungarian Oak (*Q. conferta*), are not free-growing and do not promise to be long-lived in the Arboretum. The deciduous Oaks of northeastern Asia, however, grow well and half-a-dozen species are well



A bit of the Oak collection: a rejuvenated White Oak in the foreground

established in the collections. The largest of the Asiatic Oaks in the Arboretum are *Q. variabilis* and *Q. dentata*, near the southern end of the Oak Path. The principal group of Asiatic Oaks, however, is on the southern slope of Bussey Hill between Azalea Path and the Bussey Mansion. In the mixed plantation near the summit of Peters Hill are many Oak trees, including fine specimens of several Japanese species raised from seeds collected in 1892 by Professor Sargent. Scattered through the collections are several hybrids of American species and no opportunity is lost to increase the number of these interesting trees which are known to occur wild in different parts of this country. The oldest hybrid Oak now known in the neighborhood of Boston, Mass., is at Holm Lea in Brookline and appears to have been planted about 1820. It has been named *Q. Sargentii* and from seed it breeds quite true. In the Arboretum there are good examples of this interesting and fast-growing Oak.

The natural woods assiduously preserved in the Arboretum are rich in Oak trees and some of them are now among its finest possessions. But when the Arboretum was started these trees were in an exhausted state of health, which necessitated severe pruning of the crown. For many years afterward they were unsightly in appearance but gradually they improved and now and for years past the rejuvenescence of a majority is complete. The White Oaks best respond to this treatment and many of them have not only taken on a

new lease of life but are among the most vigorously healthy and shapely trees in the Arboretum.

The Oak trees in the collection and in the woods form the brilliant feature of the Arboretum landscapes in the late fall. In the autumn the leaves of Oak trees turn later than those of other deciduous-leaved trees; the color, however, is assumed irregularly on different individuals of the same species and on some of them they are green while on others they are red or yellow. In late October and early November when the leaves of most trees have fallen, the most gorgeous tree is the Scarlet Oak (*Q. coccinea*) which has no rival among northern Oaks in the bright scarlet of its lustrous deeply cut leaves. The leaves of some trees of the Pin Oak (*Q. palustris*) turn scarlet or crimson when other individuals of the same Oak are still green and often green and scarlet leaves may be seen on the same branches at the same time. This is also true of the Red Oak, the autumn leaves of which vary on different individuals from yellow to dark red, bright red, red and yellow and brown. On the trees of the White Oak group the handsomest autumn foliage is found on the White Oak (*Q. alba*) itself. The leaves of this Oak turn later than those of most Oaks and when in perfection are a deep rich vinous red. The leaves of the Bur Oak, Swamp White Oak, Post Oak, Chestnut Oak and others turn yellow and leather-brown and from most of them the leaves fall earlier than those of the White Oak.

The Hickory or *Carya* collection is immediately on the right entering by the Centre Street gate. There a broad belt is planted with these splendid trees, which are among the noblest of the North American forests and furnish tough and valuable timber. They are trees possessed of much character in bark, bud and leaf and are obvious aristocrats. Of the fifteen species now recognized in this country, thirteen are well established in the Arboretum and so, too, are several hybrids.

Most of them have grown rapidly and have proved in every way satisfactory subjects. The exception is the Pecan of which one healthy young specimen is among the Arboretum's proudest possessions, for its ability to withstand the climate amazes us. In rich alluvial soils of more favored states Pecan trees 175 feet tall with trunks 16 feet in girth are known, but in Massachusetts one must be content if it lives at all. It is the most famous and oldest cultivated nut tree native of North America, flourishing wild in western Illinois to Oklahoma and Texas and is considered to have been planted by the Indians long before the advent of our race. The Shagbarks (*Carya ovata* and *C. laciniosa*), the two other most important Hickories from the viewpoint of their edible nuts, flourish in the Arboretum and the White Hickory and the Pignut (*C. alba* and *C. glabra*) are indigenous in the woods.

In the spring when their huge winter buds begin to awaken and the scales enlarge, the Hickory trees are rich in interest. These bud scales grow rapidly and are

often tinted with buff color ere they are thrust off by rapidly unfolding leaves with their gray, hairy coverings. The leaves are pinnate and quickly reach their full size, which is large and gives a dense canopy of shade through the summer months. In the autumn they are among the first of trees to change the color of the foliage. At first yellow, they become old gold color before they fall. The change is rapid but for a few days in the fall these trees are a brilliant spectacle in their unmatched robes of yellow and gold.



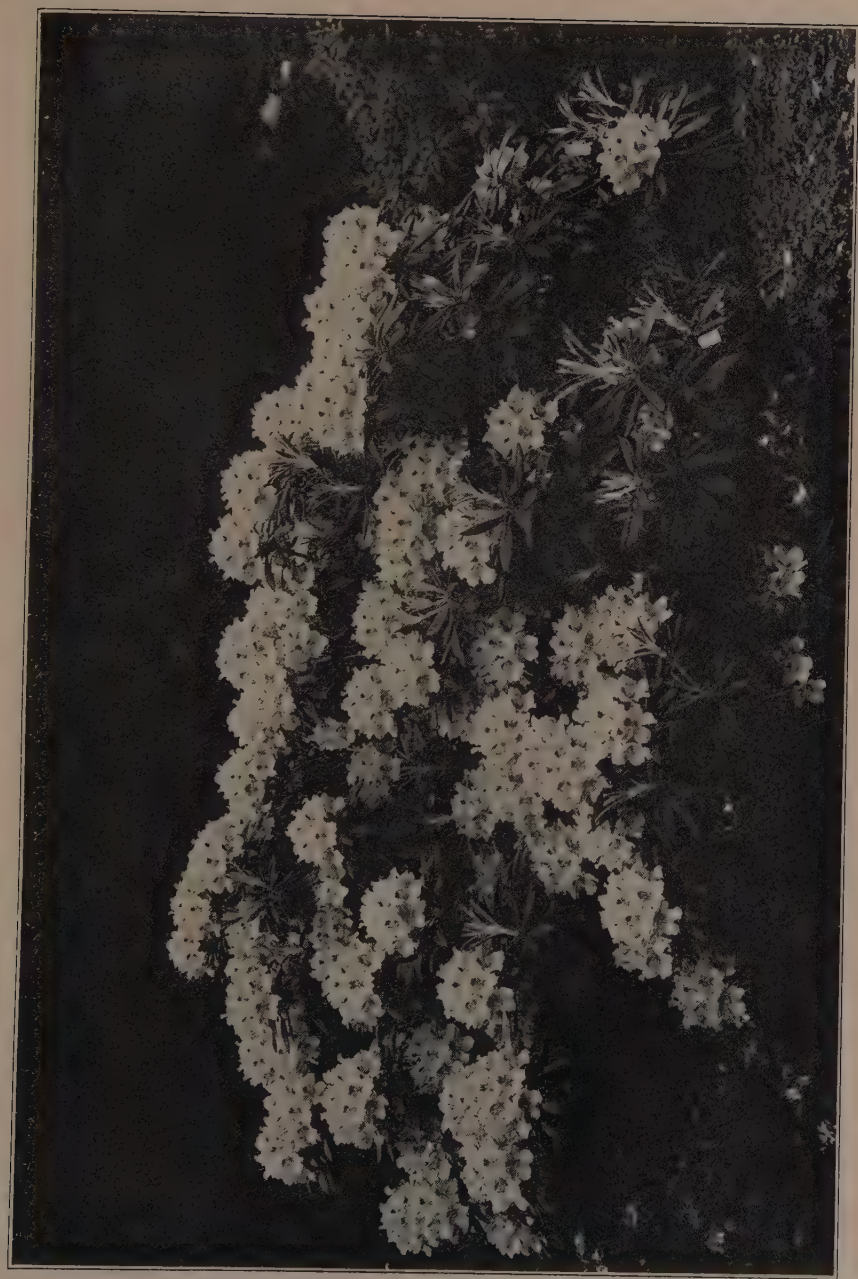
In June a blaze of gorgeous color lights every Rhododendron bush (R. album elegans)

Rhododendrons and Mountain Laurel

RHODODENDRONS with their bold evergreen foliage crowned with clusters of handsome flowers are among the noblest of all woody plants found in the north temperate regions of the globe. The flowers vary enormously in size and in the different sorts embrace all shades of color. Small wonder that the desire to possess them is so general among garden lovers. But the climate of Massachusetts is such that only the very toughest varieties survive the extremes of summer drought and winter cold. The Arboretum collection is planted at the foot of Hemlock Hill and enjoys a sheltered northern exposure. The situation is a delightful one backed by a virgin growth of Hemlock with an ever-running stream of flashing, musical waters flowing through it. Ideal, too, is the site for Rhododendrons when it is remembered that our latitude is that of Rome and that in late February and March the sun is high in the heavens. The collection of Rhododendrons was commenced in 1886 and represents the survival of the fittest. On this account it is valuable beyond words. It is also the most pampered of all collections in the Arboretum and, I regret to say, the least generous in reciprocation. Each autumn the plants are treated lavishly, each spring they distress us almost to tears with their wilful, wanton, churlish behavior. Knife and spade are re-

quisitioned to restore semblance of good appearance. Then comes June and a blaze of gorgeous color lights every Rhododendron bush and one confesses that with all their faults one loves them better every year. Wilful, wayward, ungrateful they are and more, but there is no resisting the lure of their brilliant blossoms so profusely displayed.

The modern garden Rhododendron is largely a product of the British Isles where it has been developed by enthusiastic breeders during a century past. It is admirably suited to the soft climate of those islands but the New England climate is different—very different. In the past twenty-five years several hundreds of Rhododendron species have been introduced into western gardens from China, the headquarters of the genus. Of these one only (*R. micranthum*), a puny thing with small white flowers, has proved hardy in the Arboretum. Neither have any of the modern hybrid forms raised in England proved adaptable here. Of the mighty host of evergreen Rhododendron species known, the four species native of eastern North America (*R. catawbiense*, *R. maximum*, *R. carolinianum*, *R. minus*), one from the Caucasus (*R. Smirnowii*) and the Chinese species named above alone are thriving in the Arboretum. Of the ninety named varieties growing in this collection not more than thirty are satisfactory plants. And these existing varieties are the survivors of hundreds tested out during the past fifty years.



Most beautiful of exotic species with clusters of pure pink flowers is the Caucasian Rhododendron Smirnowii

Among the most industrious breeders of Rhododendrons in England has been the family of Waterer. One of these pioneers, the famous Anthony Waterer, used to send over his best and most hardy sorts to the Arboretum that they might be tested, and on their behavior here their merit of hardiness was based. A number of the largest plants and best varieties in the collection today had this origin. More recently have been acquisitions from continental Europe, the most promising from T. J. Seidel of Dresden in 1908. These are mostly low-growing plants, satisfactory from the point of view of hardiness and floriferousness, but of indifferent color value. The best of these are Arno, Anton, Daisy, Echse, Eva, Viola and Boule de Niede, the last a splendid white. Visitors to the Arboretum in June can choose their own favorites, but from experience we consider the most adaptable to this climate are: Atrosanguineum, Charles Dickens, H. W. Sargent—with rich red flowers; Caractacus with reddish flowers; Roseum elegans, Lady Armstrong—with rose-colored flowers; Mrs. Charles S. Sargent, Henrietta Sargent—with pink flowers; Purpureum elegans, Purpureum grandiflorum—with dark purple flowers; Everstianum with light purple flowers; Mont Blanc, Glennyannum, Album elegans, Album grandiflorum, Catawbiense album, Delicatissimum, Madame Carvalho and coriaceum—with white or nearly white flowers. Very good also is Bicolor, red with white marking, and

the hybrid *venustum* or *Jacksonii*, an early dwarf sort with lovely deep pink blossoms.

The most beautiful of the exotic species is the Caucasian *R. Smirnowii* with large pure pink flowers in dome-shaped clusters and leaves clothed with a felt of white woolly hairs on the lower surface. To see this plant in bloom is worth a long journey. Most charming is *R. carolinianum*, of twiggy habit plentifully clustered with pleasing pink blossoms. Its less handsome sister *R. minus* can be seen nearby, coyly hiding its blooms among a new growth of green leafy shoots. Pretty hybrids of these and the Mountain Rose of central Europe (*R. ferrugineum*) may be seen in close association. The Mountain Rose Bay (*R. catawbiense*), with flowers of indifferent color, is represented by a number of plants and the Rose Bay or Great Laurel (*R. maximum*), last of its race to blossom, by a still larger group. Each succeeding year additions to the collection are made and in June the visitors may be sure of a feast of gorgeous color on these showy difficult aristocrats.

If the evergreen Rhododendrons rather fray the nerves by their erratic behavior, their cousins, the Mountain Laurel (*Kalmia latifolia*), comforts and consoles us at all seasons of the year. This is the broadleaf evergreen par excellence for northern gardens, for it is cheery and happy throughout the year. Native though it be, and strangely this is ever a disadvantage, it has won respect, and the exquisite com-



Mountain Laurel in the majesty of its beauty

pellent beauty of its blossoms can neither be disputed nor ignored.

Beyond the *Rhododendron* collection and continuing along the foot of the Hemlock Hill in the Arboretum is a broad belt of Mountain Laurel several hundreds of yards long. Also there are groups on the opposite side of the road. The flowering time is the end of June or early in July and forms the last floral pageant of the Arboretum's season. There are more than a thousand large plants, every shoot terminating in a broad rounded cluster of white or pink blossoms, each a fluted chalice with stamens bent backward, tense and ready to spring forward and dust with pollen every honey-seeking bee. No flower on close inspection reveals more beauty of construction, and none in mass or individually are more lovely. A broad belt of restful green for eleven months of the year, then an unmatched wealth of loveliness, myriad blossoms artfully fashioned burst into clouds of white and delicate pink.

Man has done nothing toward adding to the beauty or variety of the Mountain Laurel and the few different forms known are natural ones. On the right of the path which leads through these *Kalmias* to the top of Hemlock Hill and just where it begins there are several forms of interest to the curious. One (*fuscata*) has a chocolate band conspicuous within the cup, another (*polypetala*) has the corolla deeply cleft into narrow lobes, another (*myrtifolia*) is a dwarf with small leaves with minute flowers and another (*obtusata*)

has broad handsome blunt leaves. On the opposite side of the main roadway is a group of Sheep Laurel (*K. angustifolia*), low-growing with dull, rosy-red flowers, and another of the Pale Laurel (*K. glauca*), slender of habit with purplish rose-colored saucer-shaped blossoms. These are all pretty and interesting in their way, but the typical Mountain Laurel overshadows all, dominates the scene, defies descriptive effort, lays a hush on the tongue and thrills the soul with the majesty of its beauty.



Loveliest of Conifers in the Arboretum is the Carolina Hemlock

Conifers

THE Arboretum collection of cone-bearing plants with which, for the purpose of this chapter, the Yews may be included, is the largest in this country. It is the result of fifty years of untiring effort and represents very faithfully the range and the variety of these plants that can be grown in Massachusetts. About 116 species and a large number of varieties belonging to 18 genera are represented. The assembling of this collection is typical of the energy everywhere expended in making the Arnold Arboretum what it is. The lay mind may grasp an inkling of the special difficulties encountered by realizing that forty and fifty years ago there were few or no nurseries in this country that raised American woody plants from seeds. Of these plants in general and conifers in particular, gardens drew their supplies from Europe and mainly from England. Now in the mild, moist climate of that land the cone-bearing trees of the Pacific Slope flourish. It was from that region that Douglas, Lobb, Jeffrey and others sent the seeds of the Douglas Fir, Yellow Cedar and several Pines, Firs and Spruces. These were propagated in England and imported into eastern North America. In New England none of them withstood the winters and their loss and consequent disappointment followed. In 1862 the Douglas Fir was discovered in Colorado by C. C. Parry and seeds were later

obtained for the Arboretum. This type proved satisfactory and hardy in Massachusetts and gave to gardens a much needed and valuable tree. A similar story may be told of the Yellow Cedar (*Thuja plicata*), one of America's noblest trees. The Pacific type of the tree grows splendidly in England but is tender and quite useless here. Fortunately it has its eastern limits in Montana, and seedlings from Idaho were raised in 1880 in the Arboretum and these have proved perfectly hardy and entirely satisfactory in New England gardens.

Two other instances illustrative of the value to American gardens of the work done by the Arboretum in testing out the hardiness of conifers may be given. The English Yew (*Taxus baccata*) is not properly hardy here but the Japanese species (*T. cuspidata*) is perfectly so. This Yew was introduced in 1862 by Dr. George R. Hall who gave it to Parsons & Company, nurserymen, of Flushing, Long Island. The Arboretum plants were obtained in 1884 and their behavior here has established the fact that this Yew is one of Japan's greatest gifts to the gardens of New England.

One of the noblest and most impressive trees in the parks of England is the renowned Cedar of Lebanon, alas, not hardy in Massachusetts. Some years ago the tree was discovered on the Cilician Taurus in Asia Minor where the climate is harsh and where snow lays several feet deep on the ground for five months of the

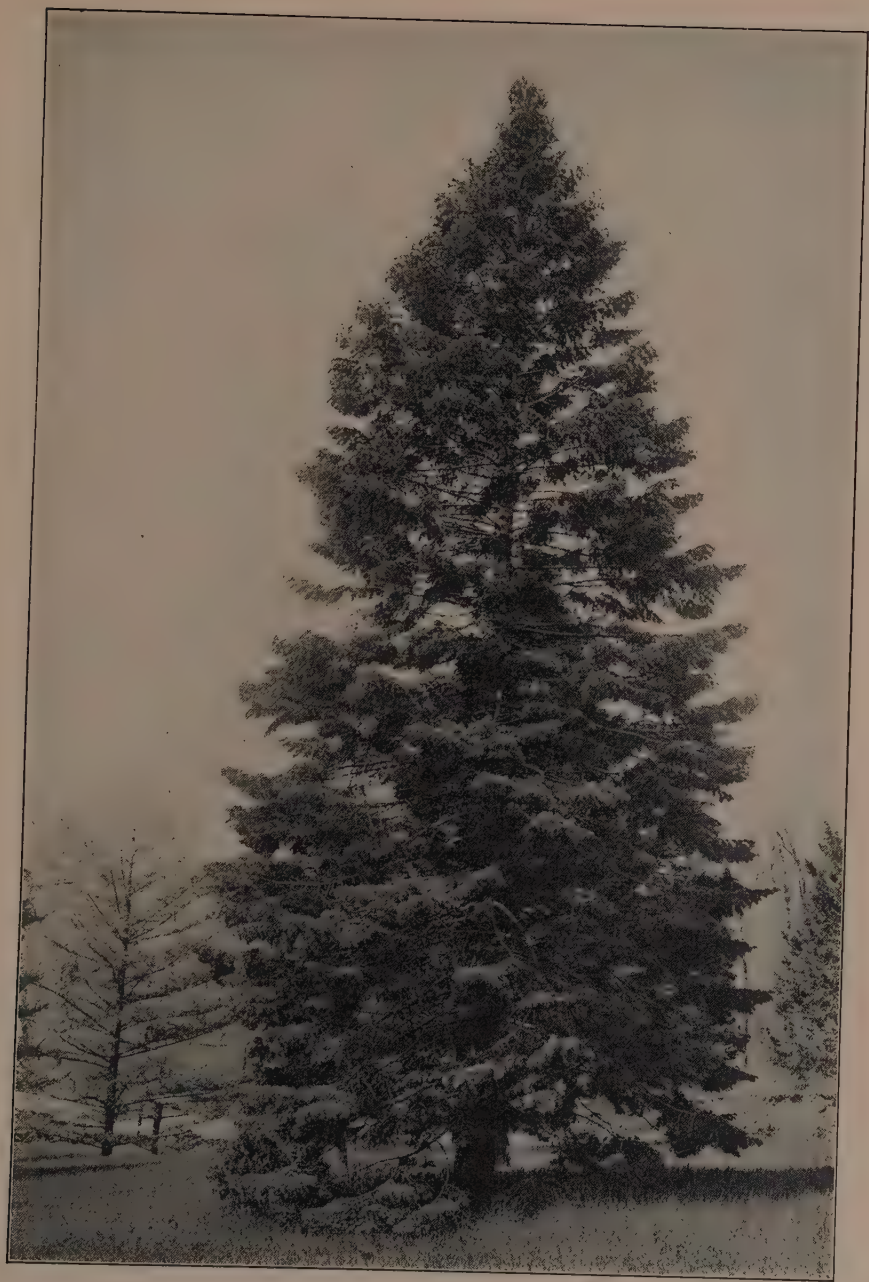
year. The discovery was made before 1868 and the Director of the Arnold Arboretum commissioned Walther Siehe, a collector living in Smyrna, to secure seeds. On February 4, 1902, ripe cones were received here and the seeds sown. They germinate freely and many plants were raised. These Cedars have grown rapidly and the tallest is now 30 feet high. In the very severe winters the leaves get somewhat scorched and turn brown and the leading shoot often suffers from attacks of the Pine weevil borer, but new ones take their place. On the whole the experiment has proved promising and certain it is that if the gardens of New England ever enjoy Cedar of Lebanon as hardy trees it will be through the foresightedness of the Director of the Arnold Arboretum.

With a climate such as that of Massachusetts it will readily be understood that the areas of the world from which hardy plant material can be culled are limited. In the matter of cone-bearing plants the Arboretum has established the fact that apart from species native of northeastern North America the only region in this continent yielding hardy types is that of the Rocky Mountains. In the Old World the regions of northern and northeastern Asia, including Japan and western China, the Caucasus and northern and central Europe are those that have favored us. There are now no large areas of the northern world unexplored and it is unlikely that many other hardy species of cone-bearing plants will be discovered. The last region to be-

come known was that of central and western China which has presented us with many new kinds of Spruce and several of Fir and Juniper. In the Arboretum these are planted on a bank facing South Street below the old Bussey mansion and visitors can themselves appraise their value.

The main collection of Conifers occupies a broad meadow, known as Kent Field, which is flanked by Centre Street and Hemlock Hill Road, with the Junipers, *Arbor-vitae* and Yews in a dell facing the Hemlock grove. On higher land behind the *Arbor-vitae* is the collection of Dwarf Conifers. A supplementary collection is planted at the foot of Peters Hill and is bounded by Walter Street. The main group of Cedar of Lebanon is on Bussey Hill near the collection of Azaleas and Chinese shrubs. The reason for scattering the groups on different sites is to afford the plants the best opportunities of soils and exposures the Arboretum affords. From various vantage points general and intimate views of the groups can be had and their stateliness of form, restfulness of character and their landscape utilities fully shown. This is not the place to dwell in detail on the merits and demerits of the different kinds. The outstanding gems may be mentioned, but the whole collection invites inspection since it is for the general education of garden-lovers.

The two best Firs for New England gardens are *Abies concolor* from the Rocky Mountains and *A. homolepis* from Japan. In the Kent Field may be seen



Noblest of our hardy Firs is the Colorado Fir (Abies concolor)

truly magnificent specimens of both,—trees fifty years old, perfect in form with branches sweeping the ground. There are likewise good trees of Veitch's Fir (*A. Veitchii*) from Japan, of *A. cilicica* from the mountains of Asia Minor, of *A. Nordmanniana* from the Caucasus and of *A. cephalonica* from Mt. Enos in the Greek Archipelago.

It is not so easy to appraise the Spruces, for all of them at fifty years of age show some defects as lawn trees. The three most promising are *Picea omorika*, the Serbian Spruce, *P. Engelmannii* from Colorado and *P. Abies*, the Norway Spruce. Perhaps no Conifer has been more popularly acclaimed than the Colorado Blue Spruce (*P. pungens*) and certainly none has been more extensively planted. In the Arboretum may be seen a tree raised from seeds collected by Dr. Parry when he discovered this Spruce on Pike's Peak in 1862. This example has lost all its lower limbs and has now only a cluster of branches near the top and is very far from being an object of beauty.

The Douglas Fir (*Pseudotsuga taxifolia*) is one of the loftiest and most valuable of the world's coniferous trees and for gardens one of the most indispensable. It has an immense range of distribution in western North America, but only the Colorado type is hardy in this Arboretum. This thrives exceedingly and both the specimen trees and a clustered group are among the most pleasing sights the Pinetum boasts.

Both the Hemlocks (*Tsuga canadensis* and *T. caroliniana*) are excellent trees, but the Carolina species with its dense and tufted branches is the most lovely.

Many species of Pine flourish but none is handsomer than *Pinus resinosa* and *P. strobus*, both native of northern New England. Of the Conifers which do not range eastward of the Rocky Mountains, Jeffrey's Pine (*P. ponderosa* var. *Jeffreyi*) is the only one really successful in the Arboretum.

A favorite spot of mine in the Arboretum is among the Junipers and Arbor-vitae. The setting, with the Hemlock grove on one side and deciduous trees on the other, is perfect. The Arbor-vitae collection is very complete and here may be seen fine examples of the multitudinous forms of the common *Thuja occidentalis*, slender spires, globose masses and weeping cones of green and every conceivable intermediate form. With these are associated the Japanese Retinisporas and excellent specimens of the Western Cedar (*T. plicata*) and the rare Japanese *T. Standishii*.

The Juniper collection is equally good. The native Red Cedar (*J. virginiana*) is present in every form from handsome trees 40 feet tall to broad wide-spreading shrubs a few feet high and yards through. Most graceful of all the tall Junipers is *J. rigida* from north-eastern Asia: columnar masses of rigid stems and hanging thread-like branchlets strung with dark green prickly needles combining grace and beauty in an extraordinary degree. Of Junipers hugging the ground



*Full of promise is the Serbian Spruce (*Picea omorika*); an Arboretum introduction*

there are many sorts but none form a more dense or attractive mat than *J. horizontalis*, — rose-violet in winter, dark green speckled with silver in summer; nothing of its class could be neater. Growing from 2 to 3 feet tall there are fine beds of Sargent's Juniper (*J. chinensis* var. *Sargentii*), dense masses of gray and rich green. The Japanese Sonare (*J. procumbens*) is there and so, too, is the new *J. conferta* from the Pacific shores of Japan. New and old species, rare and common forms, are grouped side by side and the garden value of one and all is apparent.

Nearby the Junipers are lusty specimens of the noble Japanese Umbrella Pine (*Sciadopitys verticillata*), with its long, lustrous, black green leaves arranged in whorls. When its roots are in cool soil there is no finer hardy Conifer than this unique tree.

The Dwarf Conifers have been newly arranged in a large bed and here may be seen many oddities of the group: Dwarf Pines, Spruces, Firs and Hemlocks; among them the charming *Picea glauca* var. *conica* from the Canadian Rockies—dense cones of pellucid grass green suggesting a gigantic Moss rather than a Conifer.

Among the Yews may be seen all the hardy forms and some of the finest specimens of the Japanese *T. cuspidata* in America. The grandest of all is a plant of *T. cuspidata* var. *nana* which is 6 feet tall and 25 feet through. The wide-spreading branches are rigid and the branchlets tufted, giving an amazing amount of

character to this perfect specimen, whose hardiness is in harmony with its robust character.

In this land where the winters are long and deciduous trees and shrubs bare of leaves for fully half the year, Conifers are of inestimable value. They afford restful relief to the eyes and break the monotony of the landscapes. They are a necessity in every garden, small or great, and if the Arboretum had accomplished nothing other than the amassing of its great collection of hardy Conifers it would still have justified its fifty years of existence.



Tangled vines drape the boundary walls of the Arboretum

Climbing Plants

CLIMBING plants produce the most effective of all garden pictures and the nearest approach to tropical luxuriance attainable in northern gardens. In the Arboretum vines are used for a variety of purposes and many worthy object lessons are taught. The value of climbing plants for covering walls is taken full advantage of and a general miscellany are so grown and are annually pruned well back in the late winter. By this means a tangle of new growth tops the wall and fence, hiding them under a mass of cheerful green the whole summer. Grapevines in variety are used for this purpose but their less vigorous relatives, the *Ampelopsis*, with smaller leaves variously cut and divided and orange or turquoise-blue fruit, are more serviceable. The most delightful of all is *Ampelopsis aconitifolia*, native of northeastern Asia, with finely dissected leaves and hanging clusters of fruit varying in color from white and pale purple to a perfect turquoise blue. It fruits freely and is a charming object until the frosts come. The *Ampelopsis* leaves fall without any marked change of color in the fall, but those of their relatives *Vitis* and *Parthenocissus* change to vivid hues.

At the junction of Valley and Hemlock Hill Roads and facing the *Rhododendron* collection, another method of growing Grapevines is practiced. Here

certain native species like Fox Grape (*Vitis labrusca*) and the Summer Grape (*V. aestivalis*) are allowed to form a tangled mat on the flat ground. By hard pruning in late winter they are induced to make long shoots and large leaves and are kept in reasonable bounds. The situation is moist and each autumn the coloring of the leaves is splendid.

On one of the piers of the Jamaica Plain gate and on the nearby fence *Clematis apiifolia* is encouraged to ramble at will. In late August these are a billowy mass of fragrant creamy white, conspicuous from afar.

Boulders of granite and conglomerate crop out in many places in the Arboretum. Some of these are covered with the Japanese Bittersweet (*Celastrus articulata*) whose stems are coiled and twisted into an intricate clump of growth, picturesque at all seasons of the year. In summer these uneven, hummocky masses are rich green, in the autumn clear yellow. As the leaves fall the fruit, an orange-yellow capsule which splits and displays a clustered mass of cinnabar-red, is revealed in all its beauty and abundance. These pretty fruits are borne in bunches and are retained far into the winter where they stand out in marked contrast with the small, gray, slender stems.

The collection proper of climbing plants is accommodated on a trellis round three sides of the Shrub Garden. Neat posts of reinforced concrete are inserted about fifteen feet apart in the ground and strands of stout wire run through them making a



Native Grape-vines on the Trellis: *Vitis bicolor* in foreground

trellis some 10 feet high. The climbers are planted and trained to this and form a screen and also an avenue or arbor. The perfectly hardy stem and tendril-climbing vines display their beauty to full advantage. With such an arrangement it is easy to keep each sort labelled and from interfering with its neighbors. The knife in late winter keeps all in bounds. But on such a trellis the plants are fully exposed to the elements and especially to the strong winds and draughts which are far more trying than low temperatures. It should occasion no surprise to learn that only a limited number flourish under these conditions.

The two most striking groups of climbing plants on this trellis are *Wistaria* and *Vitis*. In very severe winters many of the flower-buds on the *Wistaria* are killed, but in normal years the trellis is draped with hanging clusters of white and purple blossoms. We never get the very long racemes which the gardens of Japan boast but visitors may see and compare all the known varieties of this wonderful vine. Japanese sorts with white, pink and purple flowers and one with rather ugly, double, violet-blue flowers may be compared with the more fragrant Chinese *W. sinensis* in purple and white. The new *W. venusta* with its short, broad clusters of very large pure white flowers and the American *W. frutescens* and *W. macrostachya* are all there growing and flowering together.

To Americans in particular the genesis of the name *Wistaria* should be of interest. It was given in 1818

by the botanist, Nuttall, to an American plant (*W. frutescens*), which had been in cultivation in England since 1724 as *Glycine frutescens*, in honor of an American physician, Dr. Caspar Wistar, Professor of Anatomy in the University of Pennsylvania. In 1818, John Reeves, an officer of the English East India Company, sent from Canton, China, to England, a climber which received the name *Glycine sinensis*. In 1825, De Candolle, a Swiss, correctly referred this plant to Nuttall's genus *Wistaria*. Today, and for many decades past, *Wistaria* and *Wistaria sinensis* have been synonymous in the popular mind. Indeed, comparatively few people know that here in eastern North America there are native species of *Wistaria*, so completely has their oriental relative surpassed them in popular appreciation.

The collection of *Vitis*, *Parthenocissus* and *Ampelopsis* is extensive and in the autumn is a feast of brilliant color. The great value of American species of *Vitis* is well demonstrated by the fourteen perfectly hardy sorts flourishing on this trellis. Among the handsomest are *V. cinerea*, *V. bicolor* and *V. Doaniana*. The first-named grows wild on the river banks of the Mississippi Valley from Illinois to Kansas. It is a most vigorous plant with leaves dark green above, ashy gray below and, like the young shoots, clothed when they unfold with a felt of gray hairs. The second species is native of the northern and middle States and is equally vigorous and has large deeply lobed leaves



A fountain of white Wistaria

which are dark green above and bluish green below. The third is a comparatively new plant in gardens, native of the Texas Panhandle, but is quite hardy and fast growing, with large, rather pale, bluish green leaves of very firm texture. Other beautiful vines are the Summer Grape (*V. aestivalis*) with the leaves rusty brown on the under side; the Frost Grape (*V. cordifolia*) with thin light green leaves; the Sugar Grape (*V. rupestris*) with small, shining, metallic green leaves and reddish shoots; and *V. labrusca*, the common Fox Grape of New England. The noblest of all is *V. Coignetiae*, from northern Japan. This vine has broad, heart-shaped leaves of enormous size and much substance, dark green and netted above with a felt of brown hairs on the under side, and in autumn they change to scarlet and crimson. It is the most vigorous of hardy vines and in the moist forest of northern Japan, climbs to the tops of trees sixty feet and more tall, and in the thickets, glades, and on the margins of woods and swamps, makes an impenetrable jungle. The fruit is jet black, globose and edible and the plant is one to which breeders of new fruits might well turn their attention.

Clematis in general do badly on the trellis and the climbing Honeysuckles are not a success, but several species of Greenbrier and Aristolochia (Dutchman's Pipe) grow freely; so, too, does the vigorous and popular *Actinidia arguta* with glossy, fleshy green leaves with red stalks and small saucer-shape white

flowers with numerous black-tipped stamens. This and all other Actinidias have two forms, one which bears purely male flowers and another with perfect flowers. The latter bears an edible fruit which may be made into a preserve. Less vigorous but quite hardy is *A. kolomikta* which has a varying number of the foliage leaves, partially or wholly white, passing to pink in the fall. Similar in this respect is the Cat-vine (*A. polygama*) but unless protected by wire-netting this cannot be grown since cats insist on clawing and tearing the whole plant into shreds. The handsome *A. chinensis* is not hardy in the Arboretum but fortunately the pleasing *A. melanandra* is.

The American Trumpet-vine (*Bignonia radicans*), its forms and hybrids, do well on the trellis, but its Chinese sister *B. chinensis* is not hardy. The Oriental *Akebia quinata* and *A. lobata* do well and retain their dark green leaves unchanged in color later than any other vine. These plants occasionally fruit and their thick, fleshy, rose-purple pods which open and display the jet black seeds imbedded in white pulp, sweetish to the taste, are objects of much curiosity.

There are many other climbers on the trellis but this account may well close with mention of the new and rare *Tripterygium Regelii*. This is a beautiful vine with long, red-brown, prominently spotted stems, broad, bright green, wrinkled leaves and large terminal clusters of small white flowers which are followed by white bladder-like fruits which, changing in color to

pinkish and brown, are long retained. The plant is native of Japan and Korea where it rambles over shrubs and trees. It is perfectly distinct in appearance of shoot, foliage, flower and fruit from any other hardy vine and when properly known will become a favorite in American gardens.

On the north wall of the Administration Building grows a magnificent specimen of the climbing *Hydrangea* (*Hydrangea petiolaris*) and a very good one of the related *Schizophragma hydrangeoides*. These are valuable plants, much confused in gardens, though, really, the *Schizophragma* is rarely seen. Both are root-climbers with smooth, broad, ovate, pointed leaves and long stalks and both produce their flattened heads of flowers on short non-clinging branches. Here the likenesses end. The *Hydrangea* has an outer whorl of 4-partite, sterile flowers and a fruit which opens at the top. The *Schizophragma* has on the outside of its flower-head conspicuous white bracts, each a single leaf, and a fruit which splits down the side.

Border Plantings

THE system of metalled carriage drives and foot paths in the Arboretum was planned by the late Mr. Frederick Law Olmsted and constructed by the City of Boston under the direction of the Park Commissions. It is maintained by the Park Department under the agreement entered into in 1882. In return for this assistance Harvard University is pledged to open the Arboretum to the public every day in the year, reserving, however, entire control of the collections and of the land outside the drives and walks. The roads are broad and well built with a separate path for pedestrians on either side. A triple track of the kind is not in itself a thing of beauty but by planting the borders and the space separating the carriage drive and the footpaths with a varied shrubby growth, a low, irregular fringe of shrubs has given them a singular charm. Through the wilder parts of the Arboretum narrow grassy ways have been made which are kept closely mown. These wind through the collections of trees and across the hill slopes and provide the pleasantest of walking tracks.

It is, however, of the artistic treatment of the metalled roadways that I wish to tell here. This is worthy of general application, for roads and paths are necessary in every garden. In its scheme of beautifying the system of roads, native woody plants of low



*A delightful border of the native Seashore Rose (*Rosa virginiana*)*

growth have been largely used, together with bold clumps of taller shrubs in relief. For this border planting the fragrant Sumach (*Rhus canadensis*) and Yellow-root (*Xanthorhiza apiifolia*) have been largely used with excellent results. The fragrant Sumach is a densely branching plant with slender gray stems growing slantingly from 1 to 4 feet high. It has bright yellow flowers in short axillary spikes which appear before the leaves and are followed by red fruits ripening in June. The leaves are three-lobed and in the autumn change to wondrous tints of orange, red and crimson. Along the Meadow Road there are fine border stretches of this shrub, which is attractive at all seasons and arrests attention in the autumn by the brilliancy of its dying foliage. The Yellow-root does not grow so tall and as it spreads rapidly by underground shoots soon covers the ground with its erect stems. The flowers are small, purple in color and are borne in erect or spreading racemes at the end of the shoots and open before or with the unfolding of the leaves. These are pinnate, shining green and change to clear yellow in the autumn. The growth of the plant is dense and regular in height, making a fine ground cover. It has been very freely employed in border planting in the Arboretum where it is considered the finest deciduous-leaved ground-cover. Both these shrubs grow rapidly and are not attacked by disease or pests of any kind. They hug the ground, flourish beneath taller shrubs and if they stray beyond the limits intended for

them are easily kept in bounds by use of knife or spade.

A charming bit of roadside planting is that on the left of the Meadow Road near its junction with the Forest Hills Road. Here *Rosa virginiana*, the sea-shore Rose of New England, has been used to make a narrow border some two hundred yards long. This familiar Rose has erect stems from three to five feet tall, clothed with reddish bark, dark shining green leaves, large pink, fragrant blossoms, and rich red hips in the autumn. It suckers freely and the only attention needed is from time to time the cutting away of the old stems. When in full flower in late June this border is one of the prettiest in the Arboretum. In other parts of the Arboretum this Rose is associated with *Cornus racemosa* in natural plantings and the pure pink blossoms of the Rose harmonize perfectly with the creamy white flowers of the Cornel.

On the right hand side of the Meadow Road in front of some Horse-chestnuts there is a large mass of *Lyonia mariana*, another good plant for borders. This is a low shrub with deciduous leaves and white urn-shaped flowers borne in racemes on the leafless shoots. Though a member of the Heath family this American plant is not particular about soil or situation and is a most valuable ground-cover.

Other useful border shrubs freely planted in the Arboretum are the Choke-berries, of which there are three species, *Aronia melanocarpa*, *A. atropurpurea* and *A. arbutifolia*, all widely distributed in the eastern



Bold clumps of the evergreen white-fruited Evonymus radicans vegeta

part of this country. They all have small white flowers with rose-colored anthers borne in erect flattened clusters, showy fruits and handsome foliage. The typical *A. melanocarpa* is a low shrub growing from twelve to eighteen inches high, with stems spreading into a broad mat. A more common form of this plant is the var. *elata* which is a shrub from five to eight feet tall; both have black, lustrous fruits which, drooping on long stems, hang on the plants through the winter. The fruit of *A. atropurpurea*, which is a tall shrub, is vinous red. The leaves of these two Choke-berries turn orange and red in the autumn. The third species (*A. arbutifolia*) is a tall slender shrub of irregular habit, later to bloom than the others, with smaller leaves covered with white down on the lower surface and erect clusters of small scarlet fruits which remain on the bushes without loss of color far into the winter. The brilliant fruit and the bright red of its autumn leaves makes this, late in the year, one of the most beautiful shrubs in the borders of the Arboretum.

Along the Meadow Road especially good use has been made of various kinds of Dogwoods with brightly colored stems. For the purpose of bold dense clumps these plants are most suitable. The Red Osier Dogwood (*Cornus stolonifera*) of this country, and its yellow-stemmed form, var. *flaviramea*, are splendid shrubs. So, too, is the Asiatic *C. alba* and in the autumn the European *C. sanguinea* with its crimson foliage.

In some places alongside the Arboretum roads there are outcroppings of rock on and over which the Japanese Bittersweet (*Celastrus articulata*) makes a delightful tangle. The foliage is a pleasing green throughout the summer and changes to clear yellow in the autumn. The orange-colored capsular fruit is abundantly produced and opens to display the cinnabar-red covering the seeds.

Here and there in the border plantings are native Azaleas, white, pink, yellow, orange and flame-colored, either in clumps or individual bushes, making delightful bits of color in their season. The Black Alders (*Ilex verticillata* and *I. laevigata*), valued for their bright red berries in autumn and winter; the fragrant summer-flowering Pepper-bush (*Clethra alnifolia*); the spring-flowering Benzoin (*Benzoin aestivale*); and several Viburnums, especially the Arrow-wood (*V. acerifolium*), are similarly used. On the right-hand side of the Hemlock Hill road are planted the Canadian Yew (*Taxus canadensis*) and the Sargent Juniper (*Juniperus chinensis* var. *Sargentii*). Along the Meadow Road on the right, the varieties *vegeta* and *Carrierei* of the evergreen *Evonymus radicans* are used as bold clumps, while under some Crabapples on the left of the Forest Hills Road is a broad mat of the typical *E. radicans*. In other places Snowberries are planted as a fringe and such Barberries as *B. Thunbergii*, *B. canadensis* and *B. vulgaris* are used in relief.



Excellent for border-planting is Sargent's Juniper (*Juniperus chinensis Sargentii*)

The aim of these border plantings is to have some shrub or other attractive at all seasons of the year. Here the appeal is the pleasing foliage or flowers in spring and summer; there it is the handsome fruit or brilliantly tinted foliage in autumn; yonder it is brightly colored stems or restful evergreens in winter. The results achieved are worthy object lessons in the art and practice of landscape planting.

Food for Feathered Friends

EVERY plant produces fruit and in the Arboretum the variety in character and form is infinite.

Like the birds, we are concerned here only with such plants as bear succulent fruit, which on ripening assumes more or less brilliant colors. In the development of the flower and in the perfecting of the fruit Nature's objective is definite. It may be set forth as an axiom that in the diversity of form among flowers Nature's endeavor is mainly to insure their fertilization through the agency of insects; in the perfecting of the succulent fruit it is toward making it attractive to birds and so insure through their agency the dispersal of the seeds. Dame Nature is prodigal, but although she apparently cares nothing for the individual she lavishes endeavor on securing the perpetuation of the species and the continued safety of the race.

This cooperation invoked by Nature opens up an interesting field. Nowadays people are beginning to appreciate the feathered world and public opinion is aroused to the necessity of preserving our birds. Societies have been formed with this object in view and laws have been promulgated for the furtherance of this purpose. Far and wide the habit is spreading of fixing up boxes of various designs to serve as nesting places for our feathered friends. All this is very laudable, but something more is necessary since birds re-



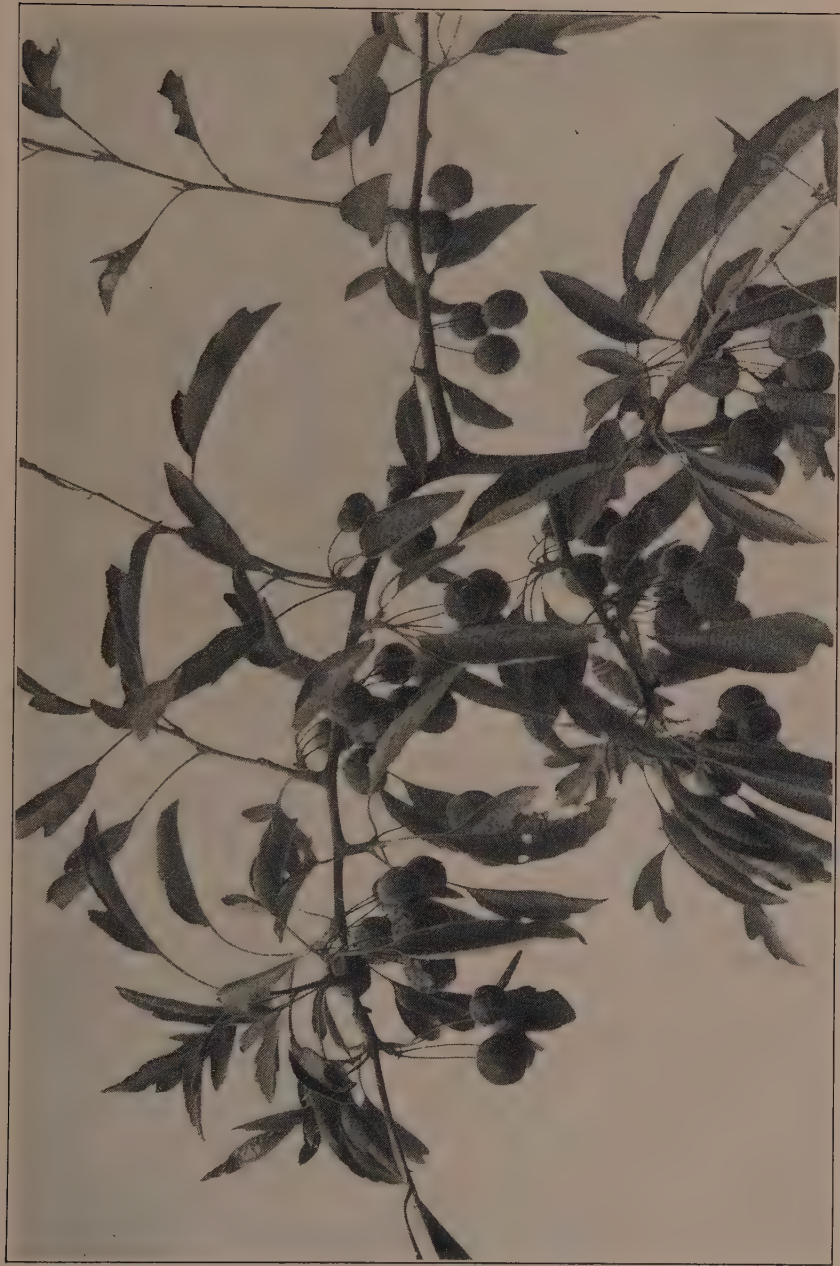
A plenteous feast for feathered friends (Lonicera bella)

quire food, and especially during the winter months, as well as houses in which to rear their young. The natural food of a great number of useful birds is in part or wholly the fruits of plants. Needless to say the Arboretum is a great bird sanctuary.

The United States Department of Agriculture is giving attention to this important matter of winter food supplies for birds, and in March, a few years ago, one of its investigators visited the Arboretum for the purpose of studying the plants growing there which might furnish birds with winter food. His examination revealed the fact that fleshy fruits of the sort eaten by birds were still hanging on the branches, and in good condition, of one hundred and ten species of woody plants, and that the fruit on fifteen other species, although dry, was still available as bird food. Of these one hundred and twenty-five species only forty-nine are natives of the United States and only thirty of New England.

In the Arboretum collections there is a vast array of woody plants which bear brightly colored fruits. A great many are natives of North America and others have come from Europe and parts of Asia, more especially from China and Japan. Of shrubs the most important group is probably the Honeysuckle family, which includes not only climbing and bush Honeysuckles, but also the Viburnums, the Snowberries and the Elderberries. This family is perhaps equalled in importance by that of the Rose family which includes

trees as well as shrubs. The more prominent members are the Hawthorns, the Crabapples, the Rowans, Plums, Cherries, Blackberries, Cotoneasters and the Rose itself. In these two families black and white and all the Cardinal colors except green occur. Next in order may be placed the Dogwood family where in the genus *Cornus*, black, white, red and blue fruits are produced on the different species. The Gooseberry and Currants have not only black, white, red, yellow, purple and wine-colored, but also green or greenish fruits. The only other hardy shrub I can think of with greenish colored fruit is the native Leatherwood. Perhaps the most popular family of berried plants is that of the Holly which has red, black and yellow fruits. Then there are the Barberries with red, black and purple fruits; the Spindle-tree and Bittersweet which belong to the same family, have white, pink, red, and orange-colored fruits which open and display the seeds with their orange or scarlet covering. The Ivy and *Rhamnus* families mostly have black fruits; the Mulberry and its relative, the Hackberry, black, white, red and orange-colored fruit. The Spicebush has scarlet fruit and the Sassafras black fruit seated in a scarlet-colored cup. The Oleasters have red or orange-red fruits; the Sapphire-berry, a native of the Far East, has clear sapphire-blue fruits. The native Persimmon has orange-colored and the Tupelo mostly blue-black fruits. The Asiatic Cork-tree has black and many of the Sumachs red fruits.



Birds have a marked partiality for Crabapple fruits (*Malus toringoides*)

In addition to the Blueberries, with their edible fruits, quite a number of native shrubs have fruits blue-black or black-purple and covered with a protective, pale, waxy bloom, and many of these before attaining their final color pass through stages of red and crimson. Foremost in this class rank the Viburnums, all of which are handsome in flower, foliage and fruit. One species, *V. cassinoides*, much planted alongside the roads in the Arboretum, has fruits which change from green to pure pink and finally to blue-black. Very attractive are the Spindle-trees with pinkish and reddish fruits often suspended on long stalks. None is prettier than *Evonymus Bungeana* which bears in great profusion stalked clusters of pink capsules, and *E. alata*, a wide-spreading shrub, with corky winged branches, red fruits and autumn foliage tinted red and crimson.

The Silky Cornel (*Cornus Amomum*) and its brother (*C. obliqua*), both planted by the ponds, are large growing shrubs with blue fruits. Other Cornels such as *C. racemosa* and *C. stolonifera* have pure white fruits, but the most beautiful shrubs bearing white berries are the Snowberries, low-growing, twiggy plants with pale green leaves, insignificant pink flowers and usually snow-white, clustered fruits.

It will be seen from what has been said that among succulent fruits, black and white and all the colors of the spectrum are represented. But in contrast with flowers the colors are usually pure. Vari-colored fruits are almost non-existent, although among the Crab-

apples, Plums, Cherries and their kin, the color may vary on different sides of the same fruit. Yellow-colored flowers are very abundant, but yellow fruits are decidedly rare among hardy northern plants.

Red fruits are most common on bush and tree in the Arboretum, closely followed by black; blue and white are rare colors and only a few have yellow or orange-colored fruits. Most of these are sports from plants with normally red fruits as in several Honeysuckles and Viburnums, though it is natural in a number of Gooseberries and Currants. But if yellow and orange are rare colors among fruits, they are common in combination with red as in plums, peaches, apricots, cherries and other comestible fruits. Of ornamental fruited trees and shrubs having fruits red and yellow in varying degrees and shades, the most important are the Crabapples, which are not only highly ornamental in fruits but retain their fruits on the branches right through the winter and well into spring. Birds are remarkably fond of these fruits and every bird lover should contrive to plant a few of these trees.



Summer in the Shrub garden: the Altai Rose (Rosa spinosissima altaica)

The Shrub Garden

A GARDEN where the convenience of the public has to be shown preference, labors under disadvantages unknown to private gardens where landscape effects alone have to be considered. More especially is this true of gardens where plants have to be arranged and grouped in some sort of sequence for the purpose of study. In the Arboretum every effort has been made to foster the natural beauty of the landscapes and add to them wherever possible, but it has not been able to overcome the disadvantage of being a public garden. In the arrangement of the collection of shrubs the aesthetic has had to give place to the practical. Even in the matter of place there was no option since a considerable flat area of land was necessary and there is but one in the Arboretum.

The site is just within the Forest Hills gate on the right. It is far from being an ideal spot for it is low-lying and suffers the first frosts in autumn and the last frosts in spring. Moreover, from its low situation the air drainage is of the poorest and it is much the coldest spot in the Arboretum in winter as it is the hottest in summer. But these adverse conditions, though regrettable are not without their advantages since they convert the Shrub Garden into a test ground for the hardiness of plants. None but the perfectly hardy can withstand the low winter temperatures experienced in

that place and visitors or students may be perfectly certain that any shrub or vine which thrives in the Shrub Garden of the Arboretum will withstand the winter's cold and summer's heat of any part of New England. So after all it serves a very useful extra purpose and one of the greatest importance to those in search of perfectly hardy plant material for their gardens.

The Shrub Garden occupies about three acres and is surrounded on three sides by a trellis on which grow many kinds of climbing plants. The land is laid out in parallel beds, each ten feet wide, with a total length of nearly $1\frac{1}{2}$ miles. These beds are separated by grass-covered paths each five feet wide. The shrubs are planted in a single row down the centre of the bed and each plant is given full room to develop properly its individuality and to show its character in full. They are grouped in botanical sequence so that students may compare readily the different shrubs which are available for planting in the northern States. The names are set forth on boldly lettered stand labels, two of which are given to each plant. These labels are placed in a position facing the grass path on either side of the shrub so that there is no need to cross the bed to find out the name. Some people, I regret to say, seem to think that the space between the shrubs is to enable short cuts to be made, and have no compunction in walking across the beds instead of along the grass walks. This involves extra work for the Arboretum

staff and not only that but many a small plant has been carelessly trodden to death in consequence. What is so freely provided for the enjoyment and study of the public surely merits their efforts toward its protection and preservation.

The garden of shrubs is established for the instruction of students, landscape-gardeners and plant lovers. The arrangement is formal and not beautiful, but is essentially one of convenience and usefulness. Only genera which have no tree species are accommodated in the Shrub Garden, but even with this restriction the space is insufficient, so groups like *Ilex*, *Evonymus*, *Rhamnus*, *Viburnum* and *Azalea* are planted elsewhere in the Arboretum. In spite of its drawback in situation and absence of landscape beauty there is probably no more instructive shrub collection in existence. Such genera as *Berberis*, *Ribes*, *Lonicera*, *Hydrangea*, *Philadelphus*, *Diervilla*, *Caragana*, *Chaenomeles*, *Spiraea* and *Rosa* are remarkably rich in species and forms, and all that are hardy can be viewed growing side by side and their garden value properly appraised. This is also true of the smaller genera and indeed of shrubs and half-shrubby plants in general. The mile and a half of beds are filled with shrubs from all the cool parts of the northern Hemisphere. Some are valuable for the beauty of their flowers, some for the charm of their foliage, others for that of their habit, others for the brilliancy of their fruits and not a few for all of these virtues. They may be seen any day in the year and

with such an object lesson available to all there is no reason for people who want really hardy shrubs planting any that are otherwise.

Apart from great variety the Shrub Garden contains many plants of exceptional merit and quite a few remarkably fine specimens of their kind. Among the Barberries may be seen fine bushes of many species. Especially noteworthy is *Berberis amurensis* with clusters of bright scarlet fruit and lustrous leaves which change to brilliant shades before they fall in the autumn. And very striking is a dome shaped bush full 12 feet tall of *B. notabilis*, a hybrid with gray leaves and dark purple fruit. Among the Honeysuckles there are sorts which burst into bloom at the first whisper of spring and others which blossom late, so a succession of flowers is kept up far into the summer and bright colored fruits may be seen on these plants from early August until late November.

Among the rarer shrubs there is a magnificent plant of *Prinsepia sinensis*, a rounded mass six feet high and more through. This shrub, with yellow fragrant flowers, small plum-like fruits, is the first plant to put forth its leaves in the spring. Another good plant is *Xanthoceras sorbifolia*, a relative of the Horsechestnut, with erect clusters of white flowers stained with red at the base and round fruits each as large as the clenched hand of a child. The collection of Japanese Quinces is rich and varied and contains forms with white, pink and apple-blossom colored flowers



*In the Shrub garden grow many Mock-oranges rich in fragrant flowers
(Philadelphus monstrosus)*

and others with blossoms of all the shades of red to fiery crimson.

The Roses in the garden are mostly wild Roses with some hybrids and not a few old favorites of long ago. The wild parents of the popular Rambler and Wichuraiana Roses may be seen with old friends like the Boursault, Persian and Harison's Yellow Roses, the Damask Rose, Cinnamon Rose, York Rose, Cabbage Rose, old Scotch Roses, Sweetbriar and the newer Hugonis Rose, Altai Rose and the Rose of central Asia (*R. Ecae*) which is upright in habit with pale yellow flowers and polished leaves which give off the odor of sweetbriar; also wild Roses from Europe, Asia and America with chaste single flowers in summer and a wealth of brightly colored hips in autumn.

Early in spring fathom-wide patches of the pink *Indigofera Kirilowii* and the white *I. decora* are in bloom with their erect racemes of pea-like flowers. In August large bushes of their relatives *Lespedeza Sieboldii*, *L. formosa* and *L. cyrtobotrya* are laden with blossoms. In spring the various Caraganas are dowered in yellow, while at the height of summer the Siberian Saltbush (*Halimodendron halodendron*), a large bush with small gray leaves and racemes of rose-pink flowers, is a joy to behold.

Of plants suitable for planting as ground-covers there are a number, and in the Shrub Garden may be seen large patches of such lovely dwarf evergreens as the Bearberry (*Arctostaphylos uva-ursi*), Cowberry (*Vaccinium Vitis-idaea*) and *Pachystima Canbyi* of

which there is no more lovely little plant. Also there is *Mahonia repens* with gray leaves and a Candytuft (*Iberis sempervirens*) which in spring is a cushion of the purest white. Last but not least may be mentioned the pleasing *Potentilla tridentata*, a plant of dwarf habit with polished leaves and white flowers.

Heather grows perfectly in the Shrub Garden, full exposure and close-cropping in the spring being the only secrets. Many varieties may be seen, from the typical Heather of the Scottish moors (*Calluna vulgaris*) to forms with white and double pink flowers. These flower in August but at the first blush of spring the charming *Erica carnea* unfolds its wealth of rosy-pink blossoms and calls for pruning back after these are past.

The climbers on the trellis round the Shrub Garden are dealt with in their own place, and there is no thought here of describing in detail the shrubs to be found in the garden itself. A few words of explanation, a fact or two about an odd plant here and there must suffice. From the thaws of early spring until snow again covers the ground at the close of the year may be seen shrubs attractive in flower, foliage, fruit or habit of growth, preeminently suited for growing in the colder parts of this country. Hardy shrubs for any and every garden and for any and every place in any and every garden.



Moonlight nights in August see the Yucca blossoms fully expanded
(*Y. flaccida patens*)

What It Does

ASSEMBLES and nurtures all that is beautiful, interesting and hardy among woody plants from all parts of the world; distributes its surplus material among kindred institutions, nurserymen and garden lovers throughout the five continents. Seeks knowledge for the sake of knowledge. Garneres information of every sort that concerns woody plants for the use of the specialist, the student and the tyro, supplying freely to the limits of its capacity all interested in its sphere of endeavor, no matter where they live. This is what the Arnold Arboretum does.

When the President and Fellows of Harvard College accepted Mr. Arnold's trust they committed themselves to an undertaking, the difficulty of which could not have been foreseen. Fifty years ago when the agreement was entered upon, only a comparatively small number of the plants now growing in the Arboretum had been cultivated or even discovered. For example, *Berberis Thunbergii* and *Clematis paniculata*, two of the best loved exotic plants in American gardens today, were unknown here, being first raised in the Arboretum and from there disseminated, to the great advantage of garden-lovers. The last half century has seen great activity in the introduction of new trees and shrubs and in the creation of new forms by the art of the hybridizer. In this work the Arboretum has played

a prominent part. The task of getting a collection of living plants together has involved extensive travel. Every temperate region of the northern hemisphere has been visited by one or other of the staff; so also have the tropics of both Hemispheres, Chile, South Africa and Australia. Nor is this work of exploration in any sense completed. At the moment an officer of the Arboretum is searching the back-blocks of north-western China and eastern Thibet for plant material to enrich the collections, and through them gardens in general.

Naturally the mountains, valleys and plains of North America have contributed largely of their flora to the collections of the Arboretum and many new kinds have been discovered in the process. After North America, eastern Asia has been the principal field of the Arboretum's activities. One of its first transactions with eastern Asia was in 1876 when William S. Clark, who had left the presidency of the Massachusetts Agricultural College to establish a similar college at Sapporo in Japan, sent a small collection of native seeds to the Arboretum. From these were first raised in America the beautiful Tree Lilac (*Syringa japonica*), the noble *Cercidiphyllum japonicum*, largest of Oriental deciduous-leaved trees, the valuable Climbing Hydrangea (*Hydrangea petiolaris*), the indispensable Evergreen Bittersweet (*Evonymus radicans vegeta*) and other interesting plants. From that date an almost constant stream of plants has



"Assembles and nurtures all that is hardy among woody plants" (*Pieris floribunda*)

flowed into the Arboretum from the Orient to the great enrichment of American and European gardens. And the end is not yet. Plants are very much like people. Not all adapt and acclimatize themselves readily. Experience has taught that the deciduous trees and shrubs of northeastern Asia, of the Caucasus region and of central Europe on the whole thrive well in eastern North America, whereas those from western North America, the British Isles and the temperate regions of the Himalayas or of the southern Hemisphere, grow indifferently or refuse absolutely to live.

The Arboretum as an established home for woody plants was a big inducement to travelers interested in gardens to collect and send to it seeds and living plants. Immediately on its founding in 1872, the institution began to get into correspondence with botanic gardens, nurserymen, travelers and others for the purpose of getting together the nucleus of a collection of living plants. Mention has been made of Thunberg's Barberry, that indispensable shrub or hedge-plant, brilliant with tinted foliage in the autumn and strung with scarlet jewel-like fruits the winter through, and of the Clematis with paniced, fragrant, white flowers now familiar on porch, fence and pergola throughout New England and elsewhere in the country. These, destined to such a brilliant future in American gardens first came as seeds from the Botanic Gardens, Petrograd, and were raised in the Arboretum. From the same source came seeds of the popular Maple (*Acer*

ginnala) than which the foliage of no tree is more gloriously tinted in the fall, and plants of the very remarkable Amur Cork-tree (*Phellodendron amurense*) which now, lusty trees and still unique in America, are growing on the right of the Meadow Road today.

The Arboretum is not a School of Forestry, or of Landscape Gardening. It is a station for the study of woody plants as individuals in their scientific relationships, their economic properties, cultural requirements and possibilities. On the information gathered in such stations successful silvi-culture and landscape gardening are dependent, for silvi-culture is the cultivation on a large scale of the trees most valuable in a particular locality, and landscape gardening demands a knowledge of the individual plants which can be naturally associated for the decoration of parks and gardens. In this connection it may be pointed out that the Arboretum is the only place in this country where the behavior of woody plants over a period of fifty years has been recorded. For the past fifteen years now the Arboretum in its *Bulletin of Popular Information* has told of the idiosyncrasies and appraised the ornamental and economic value of hundreds of plants. The more profound studies of plants are recorded in the *Journal of the Arboretum* which is published quarterly. In addition there have been prepared in the Herbarium and Library and published by the Arboretum such works as *The Pines of Mexico* and a *Monograph of the*



Of immense value to gardens are the Cotoneasters introduced from the Orient by the Arboretum

Genus Pinus by George R. Shaw; *Plantae Wilsonianae* (in 3 volumes); *The Cherries of Japan* and *The Conifers and Taxads of Japan* by E. H. Wilson; *Catalogue of the Library of the Arnold Arboretum* (in 2 volumes) by E. M. Tucker; *The Bradley Bibliography* (in 5 volumes) by Alfred Rehder; *A Monograph of Azaleas* by Messrs. Wilson and Rehder. Other works which have been prepared by the Director but not published by the Arboretum are: *Report on the Forests of North America*, being the ninth volume of the Final Reports of the Tenth Census of the United States; *The Woods of the United States*; *The Silva of North America* (in 14 volumes with 740 plates); *Trees and Shrubs* (2 volumes); also a *Manual of the Trees of North America*, exclusive of Mexico, in 2 editions. The ten volumes of *Garden and Forest* were edited in the Arboretum library, in which Alfred Rehder prepared the descriptions of a large part of the trees and shrubs included in Bailey's *Cyclopedia of American Horticulture* and in the second edition of that work, *The Standard Cyclopedia of Horticulture*.

The founding of a complete collection of the woody plants hardy in the climate of Massachusetts is but one of the main endeavors of the Arboretum. Hand in hand with this is the procuring of dried plant material and photographs of the world's forest vegetation and the formation of a library of all the books dealing with ligneous plants. The dried plant material constitutes the herbarium and is of fundamental importance in the

classification and naming of the trees and shrubs of the world. Supplying lost names of plants to garden-lovers occupies no small amount of the Arboretum's officers' time, but no inquiry on this score is ever neglected.

The herbarium, photographs and library, together with the Administrative offices, are accommodated in a plain building of red brick on the right just within the Jamaica Plain gate. The original building was the generous gift of the late Horatio Hollis Hunnewell of Wellesley, Mass., one of the most ardent and successful planters of trees. To this in 1910 a necessary wing was added for the special accommodation of the ever increasing herbarium. This is arranged in steel, dust-proof cases accommodated in three floors and comprises about a quarter of a million specimens. It contains the richest collection of cone-bearing plants known, large suites of specimens of North American trees and shrubs and probably the best representation of the ligneous flora of Japan; its Chinese and Siberian collections are very extensive. Every year large accessions to the herbarium are made and already the Arboretum has become the best place in which to study the forest flora of the Orient, for nowhere else is such complete data to be found.

The library contains 35,500 bound volumes and 8000 pamphlets. It was begun in 1873 when the Director bought for his own use a few books needed for the arrangement of the future Arboretum. This small library was gradually increased and when a few



*One of the most charming shrubs ever brought to America is Kolkwitzia amabilis,
an Arboretum introduction from the heart of China*

years later it was determined to prepare at the Arboretum an account of the trees of North America, additional works on dendrology and descriptive botany essential to the production of that work, were obtained by him. In 1892 the six thousand volumes which had by that time been accumulated were presented by the Director to the University, accommodations for a library having at that time been provided for. The library contains books in all editions and languages devoted to the description of trees. Its collection of *Floras* partly devoted to trees and monographs of genera in which trees and shrubs are described, is a large one. The assemblage of books and papers descriptive and cultural of many groups of plants are as nearly complete as it has been possible to make them. A complete set of the works of Linnaeus is found in the library; and it is believed that outside the walls of the British Museum there is not a more complete collection of the books relating to plants published in the fifteenth and sixteenth centuries.

The collection of photographs now contains about ten thousand pictures of trees and shrubs, types of vegetation, gardens and scenery. The photographs are mounted on cards and are arranged systematically in steel drawers. Some two thousand eight hundred pictures of trees of eastern Asia, Africa and Australasia form a most valuable and interesting part of this collection. The photographs have been carefully catalogued and can be easily and quickly examined.

No attempt is made to give instruction at the Arboretum to classes of University undergraduates. A few special students, often in recent years from China and Japan, are received and for many years now field lessons during the spring and autumn months are given among the collections of trees.

A youth among the great scientific gardens of the world, the Arnold Arboretum has become one of the largest and most important. Only a few years have been necessary to make it what it is today; if we pass in imagination down the centuries during which it is to function it is not difficult, judging the future by the accomplishments of the past, to picture an establishment able to increase the sum of human knowledge and human happiness in every part of the world. May its progress and usefulness continue for a thousand years, then for another thousand years and so on forever!



The Administration Building, Jamaica Plain Gate



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